

<b>Institution:</b> London Metropolitan University		
<b>Unit of Assessment:</b> 32 Art and Design: History, Practice and Theory		
<b>Title of case study:</b> Architecture of Rapid Change and Scarce Resources (ARCSR) City Making in Agra, Delhi, Mumbai and Freetown		
<b>Period when the underpinning research was undertaken:</b> 2002 to 2013		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Professor Maurice Mitchell	Professor	1990 to date
Dr Bo Tang	Senior Lecturer	2008 to date
<b>Period when the claimed impact occurred:</b> 1/8/2013 – 31/7/2020		
<b>Is this case study continued from a case study submitted in 2014?</b> Yes		

### 1. Summary of the impact (indicative maximum 100 words)

Research projects undertaken by ARCSR on sanitation (Agra and Delhi) and education (Mumbai and Freetown) have:

- Led to the installation and embedding of community-led sanitation and improved educational provision within existing informal settlements under study in India and Sierra Leone;
- Promoted the health, well-being and civic engagement of the communities in the settlements
- Influenced the working practices of the collaborating NGOs and official city policy in Agra and Delhi to promote the improvement of informal settlements in India as a more effective method of urbanisation than 'slum' demolition and rebuilding.

### 2. Underpinning research (indicative maximum 500 words)

#### Research context

Mitchell's & Tang's research on Architecture of Rapid Change and Scarce Resources (ARCSR) addressed the ongoing problem of how to create an appropriate and sustainable fit between architectural intervention and the matters of most concern to residents of transitional, informal urban settlements situated on the edge of the expanding cities of Agra, Delhi, Mumbai and Freetown. Innovative methodologies were introduced which created shared civic understandings, whereby effective sanitation and education were provided within informal settlements. These methodologies promoted a policy of incremental upgrading rather than one of demolition and resettlement which had previously been the norm. This research influenced the work of the NGOs involved and, in turn, influenced official policy in Agra and Delhi [3.1, 3.2, 3.3, 3.5].

The research built on ARCSR's engagement with informal urban communities since 2000 which has generated from first principles over 150 hypothetical schemes and proposals. This has provided a unique way of researching by enquiry and narrative construction followed by small live making projects. This 'bottom-up' research methodology focuses on the impact of interventions at the scales of home, neighbourhood and city. It promulgates a way of thinking and practising which identifies and accommodates conflicting interests within the community and minimises unintended consequences and unanticipated costs. By foregrounding the value of existing culture and physical

### Impact case study (REF3)

resources this approach has influenced city policy on informal settlements away from demolition and towards upgrading.

From 2002 to 2013, over 150 LMU architecture students and researchers led by Mitchell and Tang produced portfolio schemes from research carried out during over 20 field trips to informal settlements in Delhi, Agra, Mumbai and Freetown leading to 4 live construction projects and 3 PhDs [3.7]. Funding of just under GBP1,000,000 for this unique research environment was provided by The Water Trust educational charity. Access and support was provided through collaboration with local NGOs: Centre for Urban and Regional Excellence (CURE) in Delhi and Agra; the Association of Rural People for Health and Educational Needs (ARPHEN) in Mumbai and Community Empowerment Support Organisation (CESO) in Freetown.

### Research process and findings

Insights and new knowledge emerged as the work progressed through an innovative heuristic research methodology in which cultural and physical resistances to proposals were identified, explored and accommodated. The work proceeded through researcher group immersion in one of a range of neighbourhoods within transitional urban settlements. During approximately 16, twice yearly, two week field trips, the physical context was mapped through sketching and carrying out measured and photographic surveys. During this process of physical data gathering, researchers engaged in daily on-going conversations with residents which were recorded, together with more formal exchanges with institutions and NGO-moderated group sessions. In this way residents and researchers experimented and developed ideas jointly through collaboration in learning-by-making exercises [3.3; 3.4]. Speculative proposals at the building and neighbourhood scales were then produced by researchers in the studio and fed back to the collaborating NGOs.

This research process involved 4 live building projects where residents collaborated with NGOs and researchers in constructing:

- (2006 to 2013) Two prototype internal toilets in response to the overwhelming need of the female inhabitants of the urban village for sanitation; and an urban village scale Decentralised Waste Water Treatment System (DEWATS) in Kachhpura, Agra [3.3 pp. 273-277].
- (2008 to 2013) A community managed sanitation system in Savda Ghewra, Delhi where a lack of water and sewer infrastructure affected nine thousand resettled slum families. ARCSR collaborated with CURE in research which produced a LafargeHolcim Award winning sanitation project. Applying the collaborative research methodology described above, residents participated in its design, decision making, financing, construction and maintenance.
- (2008 to 2013) Two community single classroom bridge schools in Navi Mumbai in collaboration with Indian NGO ARPHEN, and local migrant quarry workers providing a route for the children of rural-to-urban migrants into state primary education [3.3 pp. 278-283; 3.5].
- (2009 to 2013) A primary school in Kanningo, Freetown the construction of a primary school in collaboration with the Sierra Leonian NGO CESO [3.6]

### Dissemination

The research process and findings were summarised, reviewed, developed and disseminated between 2000 and 2013 in 3 peer-reviewed books [3.1, 3.3 and 3.6] 3 papers [3.2, 3.4 and 3.5], 14 research booklets [3.7] and 2 exhibitions.

### 3. References to the research (indicative maximum of six references)

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[3.1] 2003, Mitchell M. *Rebuilding Community in Kosovo*, Centre for Alternative Technology Press. ISBN 1-90217-517-4.

**Impact case study (REF3)**

[3.2] Mitchell M. (2008), *Dispersed Initiatives in Changing Urban Landscapes*. Editor and contributor to single issue of Open House International (Vol 33, no 2) on ARCSR. ISSN 0168-2601

[3.3] 2010, Mitchell M. with Tang. B & Shamoan P. (eds). *Learning from Delhi: Dispersed Initiatives in Changing Urban Landscapes*. Ashgate. Winner of the Urban Design Group Publishers Award 2012. Reviewed by James Soane in Architectural Review, August 2010, and Marc Furnival in the Urban Design Journal 120, Autumn 2011. Univ. of Oregon UGRG (urban-geography.org.uk, 19th Aug. 2011). ISBN 978-1-4094-0102-5.

[3.4] Pear, T. and Mitchell, M. (2011) *Live Projects and their Role In Studio Teaching*, in Intercultural Interaction in Architectural Education. Collected SCHOSA conf. papers 2009. ISBN 978-0-9563-532-1-4

[3.5] Tang, Bo (2012). *Quarry Schools: Building Community Classrooms in Stone Quarry Worker Settlements in Navi Mumbai, India*. Children, Youth and Environments 22(1):280-293.

[https://www.academia.edu/3423686/Quarry\\_Schools\\_Building\\_Community\\_Classrooms\\_in\\_Stone\\_Quarry\\_Worker\\_Settlements\\_in\\_Navi\\_Mumbai\\_India?show\\_app\\_store\\_popup=true](https://www.academia.edu/3423686/Quarry_Schools_Building_Community_Classrooms_in_Stone_Quarry_Worker_Settlements_in_Navi_Mumbai_India?show_app_store_popup=true)

[3.6] Mitchell M. (ed) (2013) *The Architecture of 3 Freetown Neighbourhoods*. 2008-2013. British Council: linked to exhibitions in London+ Freetown. ISBN 978-0-9563532-4-5.

[3.7] **Booklets** - 2002 to 2013, Tang (Ed.) and various ARCSR students/researchers, Collection of 14 ARCSR Studio/Research Field Trip Booklets and Live Project reports. Available at:

<https://londonmet.academia.edu/BoTang/Studio-Publications>

<https://londonmet.academia.edu/BoTang/Research-Publications>

**Key research grant**

The Water Trust (ARCSR) – a UK registered charity (no. 1160565) - has supported ARCSR research through ongoing funding, to the amount of £80,000 - £100,000, granted annually since 2007. The total funding awarded to date (2019) is approximately GBP1,000,000.

**4. Details of the impact** (indicative maximum 750 words)**Impact on the health, well-being and sustainability of the communities**

(a) In Kachhpura, Agra, building on the prototype toilets, completed in collaboration with ARCSR in 2013, residents have taken forward the project firstly by installing the first street scale individual internal household toilets and washing spaces which resulted in the renaming of the street 'Swatch Galli' [Clean Street]. They continued to invest in building their own internal toilets and now over 1500 households throughout the urban village have installed toilets.

The land around the 100 metre long DEWATS waste water treatment system in Kachhpura has been transformed from being an insanitary, unusable space to a new community space where weddings are held.

The unique process by which the DEWATS system was developed with the community in Kachhpura has served as the model for a city-wide and state-wide co-designed approach to sanitation along the Taj East watercourse. As: *'the first of its kind in Agra and the State, [it] has significantly improved the health of residents besides creating a model for de-engineered development that can be replicated. It has been the basis for the development of the Taj East Drain Improvement Plan (TEDIP) for waste water treatment.'* [5.1 p.33] *The Plan has been reviewed and sanctioned for development by the [Indian] National Green Tribunal.'* [5.1 p.34] and integrated into the City's slum-free strategy (CSUP) [5.1]. Based on research by ARCSR this plan has changed the approach of the city's administrative system bringing together all local agencies for the first time:

*'The Taj East Drain Improvement Plan (TEDIP) was developed using [the research] developed by ARCSR. It was the first ever attempt in the state [Uttar Pradesh] of co-designing solutions by bringing together all concerned local agencies [5.2]'*

(b) The Savda Ghewra project in Delhi, on which ARCSR collaborated, is managed by an aggregation of street leaders. By March 2020, the Operation Management Committee of these street leaders had arranged the connection to water and sewer infrastructure for 237 out of a total potential of 322 households (73%) [5.6].

(c) In Navi Mumbai the classrooms completed by ARCSR in 2013 have provided access for approximately 120 students per year alongside provision for early childhood care (3 to 6 years), community activities and workshops on community issues such as adult nutrition, hygiene and women's exploitation. Currently 170 children are registered in both the classes [5.7]. The classrooms have changed the approach of the city authorities to the settlement as attested by ARPHEN:

*'This project initiated permanent classroom construction within two previously temporary mining settlements. Since then, when roadstone mines became worked out, most temporary settlements disappeared but the permanence of the classroom construction has led to more permanent dwellings constructed by residents contributing to the sustainability of the settlement. These settlements have since been provided with municipal street lighting, a bus service, street paving and water taps, and have been absorbed into the suburbs of Mumbai. Instead of road stone mining residents now work in malls, companies and industries [5.7]'*

(d) The primary school built by ARCSR in Kaningo, Freetown in 2013 has since provided education for 525 primary and 253 secondary school children each year except for periods during the Ebola outbreak (2014) and the Mudslide (14<sup>th</sup> August 2017), which passed through the neighbourhood. During these periods, the school acted as the registration office for deaths associated with these disasters [5.8].

### Impact on the NGOs and City Policy

CURE has used the research findings from Kachhpura to extend sanitation in a wide range of projects in transitional urban Indian settlements [5.1]. The reach of the research has extended to official policy towards informal settlements:

*'CURE and ARCSR have made a long and fruitful journey that has contributed to our and the State's learning curves. Research sited on real issues and real projects has enabled us at CURE to innovate and challenge convention in many areas with a particular emphasis on the built environment [5.2]'*

The findings of ARCSR's Kachhpura DEWATS research project were:

- Recognised as best practice by the Center for Science and the Environment in 2013/14 [5.5].
- Included as a case study in the training manual produced by the National Institute of Urban Affairs (NIUA) in India, for South Asian Knowledge Hub established in 2014 [5.3]. The NIUA is part of the South Asia Urban Knowledge Hub (K-hub) which was established in 2014 to improve policy making in the urban sector based on credible research and knowledge from across government, academia, non-government organisations and the private sector. Four national centres at the National Institute of Urban Affairs (NIUA) in India, ITN-BUET in Bangladesh, University of Moratuwa in Sri Lanka and Tribhuvan University in Nepal, have been connected under the K-hub. Each national centre focuses on different themes such as innovative sanitation, fecal sludge management, good governance, capacity building, housing, transportation, inclusive prosperity and regional data sharing.

- Showcased through exposure visits organized by the NIUA for 20 municipal commissioners in 2018 [5.2].

CURE has transferred ideas developed through their research partnership with ARCSR about making informal settlements more sustainable into projects in other Indian cities:

*'Our partnership [CURE and ARCSR] has unlock[ed] resources, public policy changes and local government partnerships. At the resource level, nearly US\$ 4 million was catalysed for the development of 4000 ... households in 19 [informal settlements] in Agra [5.2]'*.

In Delhi, the innovations introduced through the Savda Ghewra project have contributed to a significant policy shift relating to the issue of incremental and in-situ housing development. Slum upgrading to permanent homes with inside toilets rather than temporary 'slum' dwellings with community toilets is now preferred to demolition and resettlement and is integrated into the Delhi City's Slum Free Plan strategy:

*'[T]he impact of [informal settlement networking initiated in the Savda Ghewra project] was recognized by the Delhi Shelter Improvement Board as a sustainable solution to slum upgrading and service provision and [it has] integrated it within ... the Delhi City's Slum Free Plan [5.2]'*.

## 5. Sources to corroborate the impact (indicative maximum of 10 references)

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[5.1] **2018 Cure Capability Report.** Centre for Urban and Regional Excellence. Delhi. ARCSR and Londonmet mentioned on pages 08, 20, 23 and 33 of this report. Page 34 also refers to TEDIP and the Indian National Green Tribunal which was set up under a 2010 Act to handle the expeditious disposal of cases pertaining to environmental issues. The Citywide Slum Upgrading Project (CSUP) is an [Agra City Council] project implemented in association with CURE. This project is backed up by a slum upgrading initiative, the Cross-cutting Agra Programme (CAP) funded by USAID: <https://www.yumpu.com/en/document/read/7305650/slum-upgradation-in-agra-governance-in-india> accessed 20th July 2020.

[5.2] **CURE testimonial** 20<sup>th</sup> March 2020

[5.3] **NIUA (2017) HANDBOOK ON DECENTRALISED WASTEWATER TREATMENT MODULE, 2017** Delhi, India. CURE and Kachhpura DEWATS mentioned as example (photo p. 23 and no.2 in table 3.4, p. 25)

[5.4] Maurya, Nutan & Radhakrishnan, Karthick & Alley, Kelly & Das, Sukanya & Barr, Jennifer. (2017). **A Review Report of the Decentralized Wastewater Treatment System (DEWATS) of Kachhpura Agra.**

[5.5] Centre for Innovations in Public Systems **Urban Governance report on Kachhpura DEWATS**

[5.6] **Planning the Slum: JJC Resettlement in Delhi and the Case of Savda Ghewra** Shahana Sheikh, Subhadra Banda, and Ben Mandelkern, August 2014

[5.7] **ARPHEEN testimonial**

[5.8] **Testimonial from CESO**