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UIA 2014 DURBAN PROGRAMME PARTNERS AND GUEST EDITORS

The UIA 2014 Programme Partners have been instrumental in expanding the scope of the UIA 2014 Congress. These partnerships aim to use the event as a platform for furthering conversations around the Congress themes and pertinent built environment issues. They have therefore been initiated with a particular focus on enhancing and supporting the academic aspects of the Congress. These collaborations have been planned to fit seamlessly into the main UIA 2014 event and the synergy between the event and the Programme Partners has been crucial to the development of the Congress Programme and Content.

The Programme Partners have also acted as advisors to the General Reporter and editors for the various sections of the Abstract and Proceedings Books. The coordinators in these partnerships are listed as follows:

- Angus Donald Campbell, Senior Lecturer in Industrial Design, Faculty of Arts, Design and Architecture, University of Johannesburg
- Anna Rubbo, Research Scholar, Center for Sustainable Urban Development, Columbia University
- Ariane Janse van Rensburg, Senior Lecturer, School of Architecture and Planning, University of the Witwatersrand, Johannesburg
- Geoff Abbott, Research Architect, Built Environment Unit, Council for Scientific and Industrial Research
- Happy Ratna Santosa, Professor in Architecture, Head of the Laboratory of Housing and Human Settlements, Institut Teknologi Sepuluh Nopember, Indonesia
- Jennifer Van Den Bussche, Project Manager, Global Studio and Director, Sticky Situations
- Jia Beisi, Associate Professor of Architecture, University of Hong Kong
- Martha Kohen, Associate Professor, School of Architecture, University of Florida
- Nancy Clark, Associate Professor and Head of Graduate Programs, School of Architecture, University of Florida
- Naudé Malan, Senior Lecturer, Development Studies, University of Johannesburg
- Peta de Jager, Research Group Leader, Architectural Engineering Research Group, Built Environment Unit, Council for Scientific and Industrial Research
- Rodney Harber, Principal, Rodney Harber and Associates
- Shin Murakami, Professor, Department of Human Environment, Sugiyama Jogakuen University, Japan
- Stephen Kendall, Emeritus Professor of Architecture, Ball State University
- Tariq Toffa, Executive Manager, Social Housing Focus Trust (SHiFT) and Lecturer, Faculty of Arts, Design and Architecture, University of Johannesburg
- Terence Fenn, Lecturer, Multimedia, Faculty of Arts, Design and Architecture, University of Johannesburg
- Yusuf Patel, Executive Director, Basil Read and President, South African Planning Institute (SAPI)
UIA 2014 DURBAN SAIA-APPOINTED SCIENTIFIC COMMITTEE: CORE MEMBERS AND ADVISORS

Amira Osman, Associate Professor, Architecture, University of Johannesburg and UIA General Reporter is a National Research Foundation (NRF) rated researcher and SACAP-registered Professional Architect. As the UIA 2014 General Reporter, she heads the Scientific Committee which has a core team appointed by the South African Institute of Architects (SAIA). This core team have acted as advisors in the academic process:

Mokena Makeka, Director, Makeka Design Lab, Founder of The Museum of Design Innovation Leadership & Art, South Africa (MoDILA) and Adjunct Professor, GSAPP Columbia University New York and Resident Equity Scholar, School of Architecture and Planning, University of the Witwatersrand.

Hilton Judin, Architect and Curator, Cohen & Judin Architects and Adjunct Professor, School of Architecture & Planning, University of the Witwatersrand, Curator, blank_architecture apartheid and after.

Mphethi Morojele, Owner and Founder, MMA Design Studio, Johannesburg and Lecturer, University of Witwatersrand and Curator, South African exhibition, International Architecture Exhibition of the Venice Biennale and at the RIBA; past President of the Gauteng Institute of Architects.

UIA 2014 DURBAN GENERAL REPORTER-APPOINTED SCIENTIFIC COMMITTEE: MEMBERS AND EDITORS

The UIA 2014 Durban General Reporter has appointed three people to the UIA 2014 Scientific Committee, two of whom are the editors of the Scientific Committee publications:

Gerhard Bruyns is Assistant Professor of Environment and Interior Design, School of Design, Hong Kong Polytechnic University and Executive Team member of the International Forum on Urbanism (IFOU), Scientific Board Member of the African Studies Centre, Leiden and collaborator with CP, Arquitectura, Urbanismo, Investigacion. He was previously at the Faculty of Architecture, Delft University of Technology’s [TU Delft].

Clinton Aigbavboa, Department of Construction Management and Quantity Surveying, University of Johannesburg, holds a masters’ degree in Construction Management and a PhD degree in Engineering Management. He is a well published researcher. He is currently the editor of the Journal of Construction Project Management and Innovation.

UIA 2014 DURBAN SCIENTIFIC COMMITTEE

Ahmed Vawda, Andrew Makin, Bridget Horner, Eric Noir, Geci Karuri-Sebina, George Kunihiro (UIA Region IV), Janina Masojada, Jean Bosco Todjinou (UIA Region V), João, Belo Rodeia, Jonathan Edkins, Karel Bakker, Linda Mampuru, Luciano Lazzari (UIA Region I), Moleleki Frank Ledimo, Nooleen Murray, Phil Mashabane, Rodney Harber, Roger Schluntz (UIA Region III), Zeynep Ahunbay (UIA Region II)
UIA 2014 DURBAN ORGANISATION COMMITTEE


UIA 2014 DURBAN SCIENTIFIC PROGRAMME SUPPORT

The UIA 2014 General Reporter was supported by Gill Slaughter, Kerry Firmani (both from Turners Conferences) and Nomfundo Nxumalo, Nikita Andrews (both appointed assistants to the General Reporter). They were instrumental to the success of the process.
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A WORD FROM THE EDITORS

The response to the first and second calls for the UIA 2014 Scientific Paper Process was overwhelming. We received a total of 554 abstract submissions and, once we launched the call for full paper submissions based on the outcome of the abstract review process, we received 270 draft full papers. This means that we have completed a total of 1108 abstract reviews and 540 full paper reviews. This mammoth task would simply not have been possible without the commitment, professionalism and support of the UIA 2014 Panel of Reviewers, 87 academics and professionals, who volunteered their services to ensure the success of the process. We would like salute them!

We acknowledge the UIA 2014 Durban Programme Partners and the important role they have played in making sure that what we deliver is relevant and of a good quality. And we also acknowledge the financial support we have received from the South African Council for the Architectural Profession (SACAP).

The process we followed has guaranteed the academic quality of what is delivered at the Congress and what is published in the proceedings. All abstracts have been double blind, peer-reviewed. Authors of accepted abstracts were invited to submit full papers, which were also being double, blind, peer-reviewed. This is to comply with the requirements for subsidy and accreditation by the South African Department of Higher Education of South Africa. This process demands a rigorous peer review process by no less than two acknowledged experts in the field is to be followed for all abstracts and papers submitted.

In this book, we present you with the UIA 2014 DURBAN CONGRESS PROCEEDINGS. All included papers were double-blind, peer-reviewed. This process entailed detailed reading of the abstracts/full papers, reporting of comments to authors, modification of abstracts/full papers by the authors, editing by the UIA 2014 Editors as well as the UIA 2014 Programme Partners. All full papers were copy edited. It is only the full papers in the UIA 2014 Durban Proceedings Book (digitally available) that have successfully been accepted through the complete two-tiered, double-blind, peer-reviewed process.

The proceedings book sections are based on the UIA 2014 Durban sub-themes of RESILIENCE, ECOLOGY and VALUES as well as the themes of the 9 Programme Partners. The authors selected the themes and Programme Partners as part of their submission process. The General Reporter, and her assistants, in consultation with the Editors and the Programme Partners may have made some adjustments to accommodate topics in their appropriate slots. However, the categories were mostly as the authors initially selected.

This book must be considered as a part of the whole set of UIA 2014 PUBLICATIONS, printed and digital.

We hope you find value and inspiration in what UIA 2014 Durban has to offer you.

UIA 2014 EDITORS
Amira Osman, Gerhard Bruyns, Clinton Aigbavboa
INTRODUCTION THE UIA 2014 DURBAN CONGRESS PROCEEDINGS: HOW TO USE THIS BOOK

This Proceedings Book needs to be read in conjunction with the UIA 2014 Durban Programme Book, the UIA 2014 Durban Otherwhere Guide and the UIA 2014 Durban Exhibitor’s Guide as well as the digital publications, the UIA 2014 Proceedings Book and the UIA 2014 International Student Competition Book.

The academic paper sessions are presented in parallel sessions at the Congress Venue, the Inkosi Albert Luthuli International Convention Centre (ICC) in Durban and the Congress activities will be delivered in 38 venues. This Convention Centre complex includes the Durban Exhibition Centre (DEC) and Walnut Road that separates it from the ICC and which will be closed during the event. Walnut Road will be “occupied” by students and various other programmes. It will also have a Mussallah (prayer space) for Muslim delegates, some traders from Warwick and other architectural and artist interventions. The Programme Book offers basic and important information for delegates to navigate their way through the programme and venues.

THE PEER REVIEW PROCESS

Because of the need to maintain and assure the quality of the conference proceedings, and to comply with the requirements for subsidy of the South African Department of Higher Education, a rigorous two-stage peer review process by no less than two acknowledged experts in the field was followed. In this context, each abstract received was twice blind reviewed in terms of:

- Relevance to conference theme and objectives;
- Originality of material;
- Academic rigour;
- Contribution to knowledge, and
- Research methodology

Authors whose abstracts were accepted after the stage one review process was completed were provided with anonymous reviewers’ comments and requested to submit their full papers noting and addressing these comments. Evidence was required relative to the action taken by authors regarding the comments received. These resubmitted papers were twice blind reviewed again in terms of:

- Relevance to conference theme and objectives;
- Originality of material;
- Academic rigour;
- Contribution to knowledge;
- Research methodology and robustness of analysis of findings;
- Empirical research findings, and
- Critical current literature review.

Authors whose papers were accepted after this second review were provided with additional anonymous reviewers’ comments and requested to submit their revised full papers. These final papers were only included in the conference presentation programme and the conference proceedings after evidence was provided that all comments were appropriately responded to, having been double peer-reviewed for publication. At no stage was any member of the Scientific and Technical Committee or the editor of the proceedings involved in the review process related to their own authored or co-authored papers.

The role of the editors was to ensure that the final papers incorporated the reviewers’ comments and arrange the papers into the final sequence as captured on the Table of Contents, printed and digital documents. Of the 554 abstracts originally received, only 270 papers were accepted for inclusion in the proceedings, representing a rejection rate of 51%. To be eligible for inclusion these papers were required to receive a minimum score of 3 out of 5 allocated by the peer reviewers during the final review process. Where there were conflicts between the grades and comments by the 2 assigned reviewers, the General Reporter was assisted by the two Editors and made the final decision as to what got included in the abstract and in the proceedings books.

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UIA 2014 CATEGORIES OF PARTICIPATION FOR AUTHORS AND PRESENTERS

There were various identified categories of participation for authors at UIA 2014 Durban. These are as follows:

a) ABSTRACT PUBLICATION AND PRESENTATION. This group of participants were notified of acceptance of their abstracts. The abstract is published in the BOOK OF ABSTRACTS and a time slot is provided in the OFFICIAL CONGRESS PROGRAMME for presentation in a thematically relevant parallel scientific presentation stream. All author that failed to submit a full paper, but were the topic was considered relevant to the Congress theme, were automatically considered for this option based on the outcome of the abstract review process. Where a full paper was submitted, but not accepted for publication in the proceedings, the abstract was also automatically considered for this option.

b) FULL PAPER PUBLICATION AND PRESENTATION. This group of participants submitted full papers for review and the papers will have been deemed competent for inclusion in both the BOOK OF ABSTRACTS as well as the CONGRESS PROCEEDINGS (digital publication only). The author, in this case, was also allocated a time slot in the OFFICIAL CONGRESS PROGRAMME.

c) SPECIAL PRESENTATIONS. There will be a number of special sessions within specialised FOCUS AREAS. In some cases the authors/presenters will be advised by the UIA 2014 General Reporter to present within these special sessions. The requirements and publication options were discussed on a case-by-case basis. Some full papers were considered important and/or significant but did not meet the requirements for the proceedings document. These are published in a special publication digitally available.

All submitted and published abstracts and papers had to adhere to a prescribed format provided through a document titled: UIA 2014 INSTRUCTIONS FOR AUTHORS.

UIA 2014 DURBAN PANEL OF REVIEWERS

Zeynep Ahunbay
Zeynep Ahunbay studied architecture at Istanbul Technical University (1965-1970). She is a professor at the Faculty of Architecture ITU since 1988; lecturing on conservation techniques for historic buildings and sites, traditional building types, reuse of historic buildings, conservation of World Heritage sites; conducts studios on conservation design. She has publications on the conservation of cultural heritage, Cultural Heritage of Turkey, Istanbul and Ottoman Architecture.

Karel Bakker
Prof Karel Bakker (PhD) is currently the head of Architecture at the University of Pretoria. He is involved in the pedagogy of Design, History of historic African Environments, Heritage in many formats of undergraduate and post graduate levels, as well as in the international arena. He has published widely and performed at many international academic events.

John Bello
I graduated from Ahmadu Bello University in 1979 with an MSc (Architecture) and obtained my practice license in 1982, with the registration nos F530. My practice is called Project Design Associate (PDA), registered in 1992. I have concentrated my practice on design of buildings and infrastructural facilities for higher education.
Jhono Bennett
Jhono Bennett obtained a Master’s Degree in Architecture with Design distinction from the University of Pretoria, South Africa (2011). He completed his undergraduate education in Architecture at the University of Kwa-Zulu Natal with a supplemented semester abroad at the Carlton University, Ottawa, Canada. Jhono currently works at the University of Johannesburg as a part-time lecturer and Independent Researcher while managing the operations of 1:1 – Agency of Engagement.

Roberto Bologna
Professor Roberto is Director of the master’s degree in Architecture at the University of Florence. He has reviewed countless papers for the “International Journal of Resilience and the Built Environment and Disaster”.

Ruzica Bozovic Stamenovic
Associate professor Ruzica Bozovic Stamenovic, Ph.D. is an award winning architect, researcher and educator concurrently teaching at University of Belgrade and National University of Singapore (2000-2012). She is also Faculty Fellow of Center for Health Systems and Design, Texas A&M University and lecturing internationally on health driven design. The theory of Human Ecology, health-space and their interconnectivity is at the core of her teaching and research interests.

Christina Breed
Ida Breed is registered as a Professional Landscape Architect (SACLAP, 2006). She has practiced in many spheres of landscape architecture in the past decade. Her research includes urban ethnography and urban ecology with focus on contextual environmental and cultural suitability in design applications.

Gerhard Bruyns
Gerhard Bruyns is Assistant Professor of Architecture and Post Graduate design instructor at the Faculty of Architecture, TU Delft. He holds a both design related PhD and MSc degrees from the Delft University of Technology. He has lectured at a number of Architecture Schools [Visiting Professor at DIA] and has acted as a jury member at various universities in South Africa, Chile, Asia and the United States.

Angus Donald Campbell
Angus Donald Campbell is a qualified industrial and product designer with over a decade of university lecturing, research and freelance design experience. His research and design interests focus on design and technology for sustainable development within the South African context and are evidenced through multiple publications, conference papers and postgraduate student supervision. His Masters in Industrial Design (2003) was focused on African style in product design and foregrounded his current trans disciplinary Doctorate in Development Studies exploring innovation and adaptation of technology by small-scale urban farmers in Johannesburg.

Marianne de Klerk
Marianne de Klerk is an architect and urban designer who has worked for seventeen years on a wide range of projects in South Africa, the United States, and Asia. She brings a multidisciplinary approach to her practice with projects ranging from regional and urban revitalisation initiatives to individual buildings and infrastructure orientated urban redevelopment strategies. Her designs endeavour to balance the development, restoration and protection of Sensitive environmental sites, brownfields and cultural landscapes.

Romanda Del Nord
Since 1991 he has been head of TESIS, an inter-university research center on systems and technologies for healthcare architecture, that gathers the University of Florence and of ‘La Sapienza’ University in Rome. He works with the Department of Education, University and Research to define standards and models used in determining the building needs for schools and universities. He was head of research for the project ‘Design criteria for the humanization of hospital facilities’, on behalf of the Department of Health.
**Chrisna Du Plessis**
Chrisna du Plessis is Associate Professor at the Department of Construction Economics, University of Pretoria where she is currently leading a research programme on resilient and regenerative cities and lecturing on sustainable construction. She is also currently Theme Coordinator for the International Council on Research and Innovation (CIB) Priority Theme Sustainable Construction. Her research interests focus at both a theoretical and technological level on the principles and guiding frameworks for the practices of sustainable construction and human settlement development as informed by urban sustainability science.

**Louis Du Plessis**
Louis studied both undergraduate and postgraduate degrees in Architecture at the University of KwaZulu Natal, where amongst other achievements; he received top honors in the post-graduate course of Ecological Resource Management. Subsequent to graduating with an M. Arch in 2008, Louis has been working in private practice in Durban for a firm focusing on community, social housing and governmental projects. While working in private practice, he has been lecturing architecture part time at his alma mater since 2009, focusing on the undergraduate design studio and History of Architecture.

**Abbas Elmualim**
Dr Elmualim is a senior lecturer and coordinates the work of the Sustainable Design and FM Informatics Research Group within the School in addition to the FM Research Group that he co-established six years ago conducting research in various socio-technical aspects of digital technology and sustainability within an FM context. Dr Elmualim research work has been widely published in various journals (30 papers) and has presented at various national and international conferences (more than 70 papers). His current research focuses on the development of integrative approaches to design, construction and facilities management with particular interest in sustainability and digital technologies viewed from a broad socio-technical systems perspective and seek to combine engineering research methodologies with those derived from the social sciences.

**Fidelis Emuze**
Fidelis is presently a Senior Lecturer in the Department of Built Environment at the Central University of Technology, Free State. His qualifications include a National Diploma in Civil Engineering, a Higher National Diploma in Civil Engineering, and an MSc in the Built Environment with specialisation in Construction Management as well as a PhD in Construction Management. Fidelis has published widely in Journals and presented papers at conferences in Africa, Europe, South America, Asia and Australasia.

**Tiziana Ferrante**
Architect, PhD and Professor of Architectural Technology of the “Sapienza” University of Rome, conducts teaching and research activities for the “Planning, Design, Architectural Technology” Department. Since 1991 has been carrying out studies, research and experimentation in the field of planning and design of healthcare and social inclusion facilities, subject of numerous papers and publications. Speaker at national and international conferences; consultant on institutional committees for the evaluation of projects, collaborated in the development of guidelines and technical standards.

**Martin Fiset**
Martin Fiset is an architect with over forty years of experience in health care facilities planning and design. He has worked as a consultant, design architect and project manager on numerous projects across Canada, the United States and abroad. Mr. Fiset holds a Bachelor of Architecture degree from the Université de Montréal and a Master of Architecture degree in Health Facilities Design from Texas A&M University.

**Avi Friedman**
Dr. Avi Friedman received his Bachelor’s degree in Architecture and Town Planning from the Israel Institute of Technology, his Master’s Degree from McGill University, and his Doctorate from the University of Montréal. Avi is known for his housing innovation and in particular for the Grow Home and Next Home designs. He is the author of 14 books and was a syndicated columnist for the CanWest Chain of daily newspapers. In the year 2000 he was selected by Wallpaper magazine as 1 of 10 people from around the world “most likely to change the way we live.”
Tony Fry
Tony Fry is a design theorist, award winning designer and Professor of Design Futures, Griffith University, Brisbane working in Australia and internationally. Tony is the author of ten books and is currently completing a book on ‘The Future of Cities in the Age of a Changing Climate’. He is also director of sustainability consultancy Team D/E/S, was the founding director of the EcoDesign Foundation, Sydney (1991-2001) and as such worked for government and the private sector.

Rob Geraedts
Prof. Rob Geraedts is co-founder and member of the international CIB Working Group W104 Open Building Implementation since 1996 and Associate Professor of Design & Construction Management in the Faculty of Architecture at the Delft University of Technology, The Netherlands. His research field is Open Building: the flexibility or adaptability of the product (buildings), the flexibility of the process (design & construction), and the transformation of vacant buildings into new functions, to meet the continuously changing user demands.

Suzette Grace
Suzette Grace holds qualifications in architecture, business leadership, politics and philosophy. She’s also taught architecture at UJ for 3 decades.

Rodney Harber
Professor Rodney Harber graduated from the University of Natal in 1965 and after five years in practice began teaching in the School of Architecture, Planning and Housing at the University of Natal (now University of Kwa Zulu Natal). He taught in all three disciplines during his thirty six years before retiring as Associate Professor. Rodney is a registered Urban and Regional Planner and Heritage Practitioner and heads a busy multi-disciplinary practice focusing on developmental work all along the eastern seaboard of KZN. Rodney runs a small bustling practice from home as an extension of his commitment to teaching, with students from South Africa, Malawi, Mauritius, U.S.A., U.K., Germany, Norway, Sweden and Denmark passing through at times.

Pieter Herthogs
He studies the influence of adaptable buildings and infrastructure on the evolution of urban neighbourhoods and sustainable urban projects. He is developing assessment methods, tools and design guidelines to complement his theoretical framework on urban scale adaptability. As a teaching assistant at the BruFace English Master in Architectural Engineering (VUB), Pieter Herthogs lectures on the design of transformable structures and parametric design, and advises master dissertation students.

Bridgette Horner
Bridget Horner is an architect and Director of Space Syntax South Africa; she is also a lecturer in the Architectural Post Graduate Programme at the University of Kwa-Zulu Natal. Bridget’s expertise lies in evidence based analysis and strategic design advice empowering public and private agencies with the tools to evaluate project proposals and participate in the development of the design process.

Antje Ilberg
Antje Ilberg is an urban planner and architect with research, planning, and implementation experience at national, municipal, and grassroots levels in Sub-Saharan Africa and in the Near East. She has expert knowledge of the legal and administrative dimensions of physical planning and land management, and of informal urbanization in Africa. Since 2013, she has been with Ministry of Infrastructure, Rwanda. Urban Planning and Housing Development Expert and Adviser to Minister

Beisi Jia
He is the joint coordinator of W104-Open Building Implementation in International Council for Research and Innovation in Building and Construction (CIIB). Besides design studio, he is teaching in courses History of Chinese Architecture and Housing in Urban development in his school. He is supervisor of MPhil and Ph.D. students. His students have won more than 30 national and international student design competition, including 1998/99 Dupont Benedictus Awards, and in exhibitions, such as UIA XXII World Congress of Architecture 2005.
Hilton Judin
Hilton Judin is an architect and curator working in Johannesburg. He developed the exhibition and research projects [setting apart] and blank Architecture, apartheid and after. In practice as Cohen&Judin he worked on the Nelson Mandela Museum in Qunu and the Living Landscape in Clanwilliam.

Geci Karuri-Sebina
GECI KARURI-SEBINA joined the South African Cities Network in 2011 as Executive Manager. Ms. Sebina holds Masters degrees in Urban Planning and in Architecture & Urban Design, both from the University of California Los Angeles (UCLA). She has worked with numerous organizations including South Africa’s Council for Scientific & Industrial Research (CSIR), Human Science Research Council (HSRC), and the Advanced Policy Institute of the then- UCLA School of Public Policy and Social Research in Los Angeles, California.

Tom Sanya
Tom Sanya is a Senior Lecturer in sustainable design at the University of Cape Town’s School of Architecture, Planning and Geomatics. His main research area is building sustainability and contextuality. Using a transdisciplinary approach, he teamworks with different academics, practitioners, government actors, civil society, small-and-medium scale enterprises and members of the general public in the search for and reflection upon (innovative) solutions for long term building sustainability and contextuality.

Emeritus Johan Silas
JOHAN SILAS, prof. (retired since 2006) born in Samarinda, in 1936. As one of the founder of the School of Architecture in Surabaya Indonesia (1965) and is still teaching for graduate and post graduate students. Awarded with among others The Aga Khan Award for Architecture (1986), Chevalier dans l’ordres des Arts et Lettres (1989), Matsushita Prize (1991), Satyalancana (from the government of Indonesia 1993), The Habitat Scroll of Honour (2005), etc.

Melinda Silverman
Melinda Silverman is an architect, urban designer and urban strategist interested in settlement issues in cities of ”the global south”. She has worked for city, provincial and national government in South Africa on urban issues including sustainable human settlements, informality, low income housing, and land management practices that impact on the absorption of the poor in urban areas. She currently teaches urban design and urban policy studies at the University of Johannesburg.

Preeti Onkar Singh

Gerald Steyn
Gerald Steyn is Research Professor at the Department of Architecture of the Tshwane University of Technology. He holds BArch and MArch degrees from the University of the Free State and a PhD from the University of Pretoria.

Ken Stucke
Ken Stucke is a practicing architect registered with the South African Council for Architects. For more than twenty years, he has focused his architectural work on green architecture and sustainable development, and now practices full time in this idiom. Ken has been asked to be part of several expert critique panels and workshops, asked to review design proposals or establish project briefs.
Philippa Tumubweinee
Philippa Tumubweinee is a senior Lecturer at the Department of Architecture at the University of the Free State [UFS] South Africa, a co–Founder and Director of IZUBA INafrica and a Doctoral student at the University of the Free State, South Africa. She has also serving on the Board of Directors for: VEGA: School of Graphic Design and Advertising iMPAC: The Moving Images Festival and the 40 000 Bubbles Club After completing her M.Arch. Prof Degree in 2006 with a notable distinction in Construction, Philippa Tumubweinee was introduced to Academia while teaching at the dept. of Architecture, University of Pretoria as an assistant Studio Master in the First Year Studio from where she progressed on to join the dept. of Architecture, University of Johannesburg [UJ] South Africa.

Andre van Graan
Andre holds a PhD in architecture from the University of Cape Town and currently heads the architecture program at the Cape Peninsula University of Technology. He lectures in the History and Theory of design at undergraduate level as well as lecturing at post-graduate level in research methodologies and supervising masters and doctoral students. In addition to his academic work he is also the Immediate Past President of the Cape Institute for Architecture was well as serving on the National Board of the South African Institute of Architecture. He is a member of the South African branch of Docomomo, a past chairman of the Vernacular Architecture Society of South Africa and the convener of the Cape Institute for Architecture’s Heritage Committee.

Robert van Kats
Robert van Kats (DASUDA /BKVV), chairman, architect, urban designer architect ing. Robert van Kats has studied architecture and urbanism at the Academy of Architecture Amsterdam. The office acts on the business, governmantal, NGO and private market both national and international with the a specific focus on the African market specialised in sustainable architecture, urban planning, master planning and building related energy concepts. BKVV follow an integral approach that leads to low energy and sustainable projects.

Christo Vosloo
Qualified with BArch degree from the University of Pretoria in 1981. Completed research based March degree from the University of Cape Town and MBA from Nelson Mandela Metropolitan University. In practice since 1983 and academia since 1984 ( whilst practicing part time till 2006)

Macharia Waruingi
I am physician and healthcare executive presently holding various positions in healthcare business, academy and research. I am a Research Faculty Fellow of the Center for Health Systems & Design at the College of Architecture, Texas A&M University in College Station, Texas. I have extensive experience in advanced academic instruction in medicine, health administration and global health. I have expertise in design, development and implementation of world-class health delivery systems in the United States and frontier markets in Africa and Middle East.

David Week
Dr David Week is Executive Director of Assai Consult an international aid consultancy specialising in social infrastructure. For the first seven years of his career, David founded and co-managed a social enterprise in Papua New Guinea which developed an architecture that was modern extensions of traditional building knowledge. Since 2002. David has been an adviser to World Bank and AusAID funded large scale social infrastructure projects, including post disaster reconstruction projects in Aceh and Timor Leste.

Debbie Whelan
My architectural experience is focused on community development and heritage. I locally, I have been active in trying to promote the heritage of Edendale by instituting community projects intended to reserve earthen buildings constructed in the 1860’s. I have written a number of publications on heritage related issues.
Eric Charles Wright
Eric is a practicing architect and lecturer. He coordinates the 3rd year architecture program at the University of Johannesburg and runs the 1st and 3rd year design studios. The philosophy and approach employed in teaching investigates the changing nature of Johannesburg as a city, landscape and people. In his practice, in partnership with Claudia Morgado, Boom Architects work explore these urban-land-people focused concepts with a critical underpinning – the relevance of contemporary architectural and urban paradigms.

Carlos Zeballos
Peruvian architect, he got an MSc in Peru in urban environmental planning and another MSc in Argentina in sustainability. Subsequently he got PhD at Kyoto University, Japan in urban and landscape design. He worked for 5 years as a Post PhD Senior Researcher at the Research Institute for Humanity and Nature in Japan. Since 2013 he has launched a Laboratory of Urban and Landscape Design at the Far Eastern Federal University in Vladivostok, Russia.

Peta de Jager
Peta de Jager is a registered professional architect with a masters’ degree in applied ethics. She is currently research group leader in the building science and technology competence area for the group undertakes research and development projects which are related to building performance, architectural engineering in social infrastructure, primarily health-care and education buildings in the Southern African region.

Jacques Laubscher
Jacques Laubscher obtained his Bachelor’s degree in Architecture and Master’s degree in Urban & Regional Planning at the University of the Free State. Dr. Laubscher is currently appointed as an Associate Professor at the Tshwane University of Technology, where he coordinates and teaches the 5th year design and technology. Since 2001, he is practicing under the name Studio Jacques Laubscher, focusing mostly on the adaptive re-use of existing buildings.

Anna Rubbo
Anna Rubbo, LFAIA, B.Arch (Melbourne), D. Arch (Michigan) joined CSUD at Columbia University in 2012. A member of the Millennium Project Task Force on Improving the Lives of Slum Dwellers (2002-04) she went on to found the Global Studio, an action research project to help urban professionals work more effectively with the urban poor. Rubbo is project director for the traveling exhibition, People Building Better Cities shown in eight countries and 11 cities in 2013.

Fani Vavili-Tsinika
Professor Fani Vavili-Tsinika graduated from the School of Architecture, Aristotle University of Thessaloniki, with a Master of Arts in Health Facility Planning, Metropolitan University of London and a Ph.D. from the School of Architecture, Faculty of Technology A.U.Th. She is practicing and teaching architectural design. Her work includes health care facilities planning & design and has published many articles, research results and other publications.

Sam Moshaver
Sam Moshaver is a registered architect in province of Ontario, and currently a PhD candidate in Department of Environmental Design in University of Montreal. My research interests are in housing, flexibility and building systems. He has participated in many conferences on the issues of housing, open building, inclusionary zoning, and housing systems.

Roger Riewe
Born 22.07.1959 in Bielefeld, Germany, grew up in Cape Town, South Africa, studied architecture at the RWTH Aachen, Germany, graduated 1986, founded Riegler Riewe Architects in Graz, Katowice and Berlin (www.rieglerriewe.co.za) with projects in Austria, Germany, Switzerland, Poland, Croatia, Italy, Vietnam and Korea. The work has been published extensively. He has taught as guest as guest professor in Houston, Barcelona, Prague, Calgary and Aachen and is since 2001 a full professor at TU Graz, being head of the institute of Architecture Technology IAT and of the research lab IAT|Lab.
Gavin McLachlan
Holds the following qualifications: Bachelor of Building (1972 UPE), Bachelor of Architecture (1974 UPE), M Sc (Town and Regional Planning) (1979 UPTa). Is a registered architect and town planner. Experienced a wide range of architectural and planning work and projects prior to joining the academic staff of the then UPE (now the NMMU).

Alexander Opper
Opper completed a master’s degree in architecture at the University of the Arts in Berlin in 2001. In 2006 he moved to Johannesburg where he works as educator, writer, artist, architect and designer. He is the director of the Architectural master’s programme at the University of Johannesburg’s Faculty of Art, Design and Architecture, a context in which, since 2007, he has developed an immersive mode of teaching-and-learning premised on ‘”folding” the [architectural] studio into the field’.

Julian Raxworthy
Dr Julian Raxworthy is a Lecturer in the Master of Landscape Architecture program in the School of Architecture, Planning and Geomatics, at the University of Cape Town. He was the co-author of Sunburnt: Landscape architecture in Australia, and co-editor of The Mesh Book: Landscape/Infrastructure. His PhD thesis with the University of Queensland was entitled Novelty in the Entropic Landscape: Landscape architecture, gardening and change.

Stephan Kendall
Dr. Stephen Kendall’s career in architectural practice, research and education spans more than 35 years. He is a registered architect w/a PhD from MIT. His research in open building encompasses new design methods and logistics, and new technology needed to make buildings more adaptable, easier to customize to meet changing preferences and thus more sustainable.

Taibat Lawanson
Taibat Lawanson is a senior lecturer and coordinator of postgraduate programs at the Department of Urban and Regional Planning, University of Lagos, Nigeria. She holds a PhD in Urban and Regional Planning; and is a 2013 World Social Science Fellow. Her research over the years has focused around poverty and informality, environmental health and governance dynamics in the Lagos Metropolis; and more currently Africa’s emerging urbanism, urban livability and urban inequalities.

Yashaen Luckan
Yashaen Luckan is an academic and practicing architect. He holds a Btech Degree (DUT), and a Master of Architecture Degree from UKZN where he is presently a PhD Candidate. Yashaen serves on professional bodies such as the South African Council for the Architectural Profession (SACAP), where he is a member of the Validation Panel and the Heads of Schools committee, and the Council on Higher Education (CHE) where he serves as evaluator of applications for new academic programs.

Andrew Makin
Formed designworkshop: sa with Janina Masojada in 1997. Regular writer on the City as an important enabler of an optimized South African economy culture and society. Current projects are a village for 1000 orphans, many of HIV Aids; Community Centers and Sports facilities in two historically black townships; a hotel and apartments; a range of private residential houses; and a 25 story office building in Sandton, Johannesburg’s Corporate business district

Jako (Jakobus Immanuel) Olivier
After graduating in Law at the University of the Free State, Jako successfully completed his degree in Architecture at the same university. He is currently the program director for and lecturer at the Department of Architecture, UFS. His research interests are architectural design, architectural theory and higher education.
Happy Ratna Santosa
Happy Ratna Santosa is lecturer/professor in the department of Architecture, ITS, Indonesia since 1976 and head Laboratory for Housing and Human Settlements ITS. She is lecturer in Architectural Design, Human Settlement and the Environment, Sustainable Development, Human Settlement in Urban Development and Research Methodology. He is also supervisors for under graduate final Project Design, thesis for Master and PhD student's dissertation.

Luciano Lazzari
Luciano Lazzari was born in Trieste, Italy and grew up in Cape Town, South Africa, where he began his studies in architecture at UCT. He qualified at the Polytechnic of Central London, taking the RIBA Part III exam in 1977. After working in London, he moved back to Trieste and set up a joint architectural office in partnership with Paolo Zelco in 1981. The office has carried out a lot of residential development and health care buildings and more recently the office has become involved in urban renewal. He is currently serving as President of the Architects’ Council of Europe after his election for a two year mandate. From 2005 till today, he has been a jury member for various national and international competitions and is a member of the Scientific Committee for the UIA 2014 Congress in Durban.

Denise Morado Nascimento
Denise has a degree in Architecture and Urbanism, MA in Architecture and Ph.D. in Information Science. She is a Professor at the School of Architecture at Universidade Federal de Minas Gerais, coordinator of the research group PRAXIS (Social practices in urban space) and researcher of CPNq.

Abimbola Olukemi Windapo
Dr Abimbola Olukemi Windapo is a Senior Lecturer at the Dept. of Construction Economics and Management, University of Cape Town. Abimbola’s career spans 26 years after graduating from the University of IFE with a BSc (Hons.) degree in Building. She has both MSc and PhD degrees in Construction Management and Building respectively. She has practiced in, written, lectured and researched on housing and construction studies; building materials; and construction industry, company and project performance. She is a member of the South African Council of Project and Construction Management Professions.

Roger Schluntz
Schluntz received his Master of Architecture degree from the University of California, Berkeley. A Fellow of the American Institute of Architects and NCARB certified, he is licensed to practice architecture in New Mexico and Nebraska. In a consulting capacity with public agencies and universities nationwide, Schluntz has served as the Professional Adviser for over twenty-five major design competitions. One of the first group of those serving on the National Register of Peer Professionals for the US General Services Administration, he has been involved with the selection of architects and the design review of major public buildings for over three decades.

Kevin Bingham
Kevin Bingham is a Professional Architect and a director at FGG Architects Inc, based in Durban. He holds a National Higher Diploma in Architecture, a Bachelor of Architecture degree, a Master of Architecture Degree by research, is currently reading for a PhD in Architecture and is a Fogarty Research Fellow (USA). Kevin is the current president of the KZN Institute for Architecture (2012 – ) and is a member of the South African Institute of Architects National Board. He serves on numerous education advisory boards, trusts and sporting committees.

Fanuel Motsepe
Having lectured at the University of the Witwatersrand Johannesburg for 4 years, Fanuel practices as an architect and urban designer. Fanuel established Motsepe Architects Research Unit and Practice Unit Learning Apprenticeship (MARU a PULA) cc, which is equipped with a library, a computer lab, an audio-visual room, and a model-making studio. MARU a PULA engages local and international researchers and publishes research findings.
Claudia Morgado
Claudia (M Arch prof WITS 2007) is a practicing architect and part-time lecturer at the University of Johannesburg, working in the 1st and 3rd year design studios. In 2009 Claudia formed BOOM Architects in partnership with Eric Wright. Their work explores urban and people focused concepts with a critical underpinning – the relevance of contemporary architectural urban approaches, and a focus on systems that gain value over time with lasting benefits to those it impacts. Both partners at BOOM are co-founders of the (in)formalStudio, in collaboration with 26’10 south Architects, Thorsten Deckler and Anne Graupner, and have implemented the Marlboro South course held in 2012. (in)formalStudio is a multidisciplinary platform which pools resources and skills on in-situ teaching, research and actual projects located in complex urban conditions.

Stephen Adams
Stephen Adams is a British Trained architect, with experience of developmental and disaster relief work in Lesotho, Swaziland, Kenya, Aceh Indonesia and Haiti. Recently, he has been teaching at the Polytechnic of Namibia as studio leader in the new school of Architecture and is the external moderator/examiner for TUT Pretoria, University of Johannesburg and University of Pretoria. He has also practiced in London and Oxford.

Magdalena Cloete
Magdalena Cloete qualified with a B.Arch from UOFS in 1998. In 2012 she joined the University of KwaZulu Natal where she lectures History and Theory of Architecture as well as Architectural Design and Technology in the 3rd year BAS programme. Magdalena’s research relates to the role of Theory in the making of architecture and the relation between Architecture and People. She is a Professional Architect and co-founder of an architectural Company XO consultancy.

Tsinikas Nikos

Joanne Lees
Joanne Lees qualified as an Architect in 1990. She has over 20 years’ experience as an architect, development manager, housing and urban development specialist, for (mainly local) government, NGO’s, Social Housing Associations, and the private sector. She has been a principal of Lees + Short Associated Architects for 18 years. Her experience has underlined the importance of integration across sectors, and of socio-economic concerns in the quest for sustainable cities and settlements.

Hannah le Roux
Hannah le Roux teaches, practices, curates and writes about architecture. Her current research, lived modernism, is being developed for a PhD candidate in the Faculty of Architecture and Art of KU Leuven. This project is based on the observation of change in time of modernist spaces, grounded in the 1950’s model township, KwaThema, the 1950’s to 70’s fabric of Johannesburg’s inner city and tropical architecture in West Africa. Her writing appears in Domus, uncube, the Journal of Architecture, Architectural Record and others.

Krishna Kumar Dhote
Working as Professor in Department of Architecture and Planning, involved in research and consultancy projects of urban renewal, social impact assessment and issues of housing for poor and presently guiding more than five number of doctoral candidates.
Chris Adendorff
Professor Chris Adendorff is an entrepreneur and academic who since 1985 built a substantial family business. He holds a double doctorate in commerce as well as future studies. He has a passion for future studies and the management of family businesses. His particular interest is in planning, governance and turnaround strategies. He lectures on future studies, entrepreneurship, construction management and research methodology. Professor Adendorff has since written various books and published extensively in international journals.

Nancy Clark
Nancy Clark is founder and Director of Global Lab research consortium, a cross-disciplinary research initiative with the University of Florida focused on the study of emergent global trajectories in architectural practice, building technology, and urban policy making. She is Co-Founding member of the Consortium for Hydro-Generated Urbanism (CHU) which proposes new paradigms for the evolution of water-based settlements. Ms. Clark is currently the Assistant Director at the University of Florida in charge of Graduate Programs at the University Of Florida School Of Architecture and serves as the Coordinator of the G|SoA Ivan Smith Endowment, a program dedicated to the advancement of graduate education.

Nhlamulo Ngobeni
Nhlamulo Ngobeni graduated with a master’s degree in architecture from the University of Johannesburg, under the supervision of Amira Osman. In his master’s dissertation, he looked at Kliptown informal settlement in Soweto, Johannesburg. He unpacked the area in search for design informants which were processed to feed his architectural proposal. He was recently invited by an artist to study a neighborhood and give advice which will be used to establish where the artist could install public art sculptures.

Clinton Aigbavboa
Clinton Aigbavboa holds a masters’ degree in Construction Management and a PhD degree in Engineering Management respectively; with sustainable human(e) development being the theme of his researches. He recently completed a short learning programme in good governance in Africa from the Thabo Mbeki Africa Leadership Institute in the University of South Africa (UNISA). He is permanently employed at the University of Johannesburg’s Department of Construction Management and Quantity Surveying where he lectures at both the undergraduate and postgraduate levels. He is the programme coordinator for the 2nd year level and facilitates an academic excellent/development programme to high schools in Krugersdorp- West Rand, through an NGO based in Krugersdorp. His research interest is in the economics of infrastructure development, sustainable human development, building information modelling, climate change and adequate housing development, green job creation, leadership in lowincome housing, building post occupancy evaluations, construction industry development, informal housing and infrastructure development and national economics. He has published articles in reputed journals and presented research findings locally and internationally. He is currently the editor of the Journal of Construction Project Management and Innovation.

Phil Astley
Phil Astley, UCL Bartlett School of Construction & Project Management, London, is involved in a number of cross-disciplinary research and health enterprise projects. He has developed briefing for medical respite care for the informally housed and single homeless with TB and HIV for London Pathway. He is involved with African Prisons Project and UCL Population Health. In 2014 he is working with the Afomral territories Studio, University of Johannesburg on briefing for healthcare systems in informal contexts.
Budoor Bukhari
An architectural and urban designer and urban development planning researcher, Budoor is a graduate of the Building & Urban Design in Development (BUDD) program at the Development Planning Unit, The Bartlett, University College London. She is a LEED Accredited Professional and an Estidama Pearl Qualified Professional, and has recently joined CH2M Hill as Urban Designer. With a background in architectural and urban design, Budoor’s educational and professional journey thus far have stimulated a keen interest in the role and potential of community-based and participatory approaches to urban development planning and design.

Amanda Breytenbach
Amanda Breytenbach, has been involved in Interior Design Education for over 18 years and have also participated, over the past 12 years, in the development of the Interior Design profession. Apart from her participation in the Interior Design profession and education, she has also actively participated in including sustainable design issues within the education curriculum. She is currently Vice Dean at the Faculty of Art, Design and Architecture at the University of Johannesburg.

Gabriella Carolini
Gabriella Y. Carolini is the Ford Career Development Assistant Professor in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology (MIT). Gabriella has studied and been an affiliated researcher in universities in Brazil, France, Mozambique, and the UK. She earned her doctoral degree in urban planning from Columbia University, where she also held a National Science Foundation IGERT fellowship in international development and globalization. She is also currently the co-chair of the Global Planning Educators’ Interest Group within the American Collegiate Schools of Planning.

Nicola Darke
Nicola Darke holds a Masters in Conservation of the Built Environment from the University of Cape Town and currently heads the school of architecture at the Nelson Mandela Metropolitan University. In addition to her academic work she is also a Past President of the Eastern Cape Institute of Architects and a past member of the National Board of the South African Institute of Architects. Furthermore, Ms Darke is a member of the Provincial Heritage Resources Authority BELCOM and the convener of the Eastern Cape Institute for Architects Heritage Committee.

Noëleen Murray-Cooke
Noëleen Murray is an architect and academic. She is currently a Senior Lecturer at the University of the Western Cape (UWC) where she teaches courses in urban geography and is convener of the Masters and PhD Programmes. She is the lead researcher for the project Cities in Transition. She serves as a member of the board of the Lwandle Migrant Labour Museum. Her research, writing and creative work considers spaces as diverse as the migrant labour compound, the suburban shopping centre, housing developments and most recently the shaping of the UWC campus.

Yusuf Patel
Yusuf Patel studied Financial Economics at the University of London, Development Planning and Quantity Surveying at WITS. He is a professional planner and a development specialist. He has a wide range of experience including Integrated Development Planning, Infrastructure Investment, Affordable Housing and Community Development. He is Executive Director at Basil Read and President of SAPI.

Finzi Saidi
Finzi Saidi is an architect and landscape architect. He completed his PhD at the University of Pretoria in 2004 on Architectural Education. He is currently the Head of the Architecture Department at the Faculty of Arts, Design and Architecture, University of Johannesburg.

Tariq Toffa
Tariq Toffa, Executive Manager at SHiFT, lectures in the University of Johannesburg’s architecture department, and writes for www.Urb.im on social and urban topics. He completed his professional architectural studies at UCT, an architectural research Masters at WITS, and studied religious and constitutional law at UKZN.
Boban Varghese
Boban Varghese is an architect, industrial designer and an educator, with three decades of experience as a design studio leader. He has embraced a ‘locally grounded-globally conscious’ ideology in creating a contextually driven design in his teaching career. His studio based teaching is shaped by the experiences and exposure gained from working and teaching in India, Japan and South Africa. His academic and research pursuits are broadly categorized into sustainable architectural developments, architectural education for a changing world, bamboo as a material for economic activation, housing solutions in underdeveloped communities and media and branding in design engagements. He is currently the head of the department of architecture at the Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Sibusiso Sithole
Sibusiso is a qualified Candidate Architect from the University of KwaZulu Natal. He has a wide and varied mix of experience gained from working with a number of acclaimed architects from locally and abroad. With experience in design concept development, working drawings, presentation, documentation, digital and physical model realization. He joined Architects collaborative in 2012 where he is involved on a wide range interesting and ground breaking projects and now is a full time lecturer at the University of Kwazulu Natal while reading for his Doctorate Degree whilst still maintaining a strong working relationship with Architects Collaborative.
PART 7: DESIGN SOCIETY DEVELOPMENT (DSD)

DSD (www.designsocietydevelopment.org) is a Community of Practice (CoP) based in the Faculty of Art, Design and Architecture (FADA), University of Johannesburg (UJ). Its members represent the disciplines of Design, Development Studies and Economics. In the face of staggering inequality in South Africa, DSD interrogates research and projects that focus on the intersection of design, society and development.

Angus Donald Campbell, Senior Lecturer in Industrial Design, UJ, is a qualified industrial and product designer with over a decade of experience. His interest is in design and technology for sustainable development and his current transdisciplinary Doctorate in Development Studies explores innovation and adaptation of technology by small-scale urban farmers in Johannesburg.

Terence Fenn, Lecturer in Multimedia, UJ, is interested in interactive design and is currently enrolled for a Masters in Information Technology at UCT. He initially trained as a fine artist and obtained a Master of Art and Design Education at the University of New South Wales. His primary areas of interest include design for social development, design thinking and interactive technologies.

Naudé Malan, PhD and Senior Lecturer, Development Studies, UJ, has previously studied participation in Agricultural Development and his Doctorate investigated the role of Civil Society in the realization of the right to have access to social security. He is a Visiting Research Fellow at the Centre for African Studies at Cambridge University and has taught at various faculties within UJ.
TRANSIT ORIENTATED DEVELOPMENT AND ITS APPLICATION IN A SOUTH AFRICAN CONTEXT

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Abstract

South Africa is experiencing a rapid rate of urbanisation, and as a result is struggling to expand infrastructure, build housing, provide health care and educate its population. Transit Orientated Development (TOD) is well known worldwide urban phenomenon linking transport infrastructure to property development in a sustainable way. It is possible that TOD principles, developed carefully within a South African context could help urbanise South Africa in a structured, rapid and sustainable way.

Keywords: transit orientated development, TOD, sustainable development, development, transit, transportation, South Africa, Africa, urbanization.

INTRODUCTION

"A good land use plan is a good transportation plan" Brent Toderian, President of the Canadian Council for Urbanism.

South Africa is experiencing a rapid rate of urbanisation, and as a result is struggling to expand infrastructure, build housing, provide health care and educate its population. Transit Orientated Development (TOD) is well known worldwide urban phenomenon linking transport infrastructure to property development in a sustainable way. It is possible that TOD principles, developed carefully within a South African context could help urbanise South Africa in a rapid, sustainable way.

Major centres in South Africa are experiencing rapid urbanisation, this is compounded by a burgeoning immigrant population from the SADC1 region. Johannesburg, Specifically the Gauteng city region is set to grow into a “megacity” of 30million people in the next 40 years or so (Wood et al. 2012).

GAPP has carefully outlined a scenario of urban densification under the GSDF2 that aims to densify the extensive urban sprawl that exists in post Apartheid South African cities. It is carefully based on identifying sustainable city building solutions by identifying pockets of redundant land around existing and potential transport interchanges for development3. This study also identifies expanded rail/transport systems as a logical extension of existing networks by consultation with transport planners.

SO HOW TO ACCOMMODATE ALL THESE PEOPLE IN A SUSTAINABLE WAY?

It is no secret that sustainable cities (or those that are close to being so) are cities which have a great urban transit network, linked to an advanced land use policy which seeks to lessen the use of the private motor car.

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1 South African Development Community comprising South Africa, Botswana, Namibia, Zimbabwe, Mocambique.
SO HOW DO YOU LINK LAND USE AND URBAN TRANSIT?

Again, there is no secret here, urban transit stations (rail, BRT, etc) are well known to be great attractors of activity, especially if there are interchanges between different modes of public transport (i.e. a modal interchange). These places become great meeting points, retail outlets, service outlets and desirable places to live, if you can’t afford a car. These hubs exist all over South Africa in a natural response to a creation of a modal interchange at any given location.

Unfortunately, these nodes have been allowed to grow without any form of guidance. Transport planners don’t speak to town planners, so what results is an urban ‘free-for-all’ that does not address land use in and around these nodes, especially with walking distance (500-800m radius) of the hub. People are crammed onto pavements, have to cross busy streets and bus ranks, do not feel safe and have to walk vast distances to their homes. Retailers are either street traders, traders in poorly planned and built markets, or mainstream retail outlets crammed into a traditional mall some way from the node with high security. Notwithstanding this, they are hidden gems. If master-planned properly, these nodes can become great places which thrive with activity. To really let these places take off you have to link them to each other via the transit network so that each node becomes a destination in its own right. If these destinations can offer people ‘work, live, play’, i.e. allow people to live work and socialise without having to jump in their car. These nodes then become a “necklace of pearls” (Cervero et al. 2004) (Figure 1), where the “pearls” are high density nodes of mixed-use activity linked together along transit routes, be they BRT, rail or other transit network, “the necklace”.

![Fig 1: Necklace of “pearls” (Cervero et al. 2004).](image)

This type of concept is further enhanced by creating a “bi-directional flow”. Because each of the nodes is a destination in its own right, there is no need for the working population of a large city to surge into the CBD in the morning and then rush out in the evening, creating a wasteland after hours and letting the transit network sit and do nothing in between. Instead people ideally move in both directions, working in one node, living in another. Visiting friends and relatives, shopping, etc. This then evens out the flow in the network, allowing all day usage and therefore increasing the viability of the transit network.

This is nothing new, Scandinavian cities have done this for a long time. Copenhagen’s five-finger-plan (Figure 2) is long acknowledged as one of the prime examples of land use appropriation in relation to transit networks.
The Scandinavians soon realised that high tidal flows of traffic into medieval city CBDs were causing extreme congestion. Satellite rail-served towns were conceptualised to attract people out of the main CBD’s and serve as development and investment corridors to boost growth. A spin off of this is a transit focussed city plan that has a high sustainability factor and reduces the number of car trips people need to take (Kenworthy & Laube 1999). This is not only for rail based systems. In Brazil, Curitiba’s BRT system is noted as one of the finest examples of BRT related corridor investment and development.4

HOW DO YOU MAKE A PEARL?

In South Africa, development adjacent transit hubs are exactly that, Transit Adjacent Development (or TAD). Property owners/developers experience some benefit from being near the transit hub because of footfall. Outside of the walkability radius (500-800m), retail outlets have to concentrate on pedestrian routes for exposure.

Transit Orientated Development (or TOD) is recognised worldwide as means of promoting sustainable quality development and reducing dependence on car use (Calthrope 1993, Cerver et al. 2004, Dunphy et al. 2004). TODs promote mixed use, walkable and compact cities. TODs are integrated developments where a vast amount of thought is given to quality of the urban space. TODs feature key urban design components that discern them, namely the 3 D’s:

1. **Design** (physical features, site layouts, aesthetics, and amenities that encourage walking, biking, and transit riding as well as social engagement)
2. **Density** (having enough residents, workers, and shoppers within a reasonable walking distance of transit stations to generate high ridership)
3. **Diversity** (mixture of land uses, housing types, building vernaculars, and ways of circulating within neighbourhoods)

Truly integrated TODs where property achieves maximum value is based around the 5D’s (Cervero and Kockelman 1997), the three above including:

4. **Distance (to transit)** - (ridership among residents and workers often tapers exponentially with distance from a railway station)
5. **Destination accessibility** (how well a TOD is connected to retail shops, activity centres, and other popular destinations).

To do this, careful master-planning of the TOD is important to get the mix of residential, retail, transit and commercial right for the area it is applied to. TOD theory has been proven internationally and as a result is included in our National Development Plan 2030:

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Transport 2015-2020

"Guided by plans for the urban form, the focus will be on achieving the mutually reinforcing effect of transit-led growth" (Chapter 4, p. 189).

Urban futures

"New urban development and infrastructure investments should be focused around corridors of mass transit and around existing and emergent economic nodes, applying internationally accepted principles of transit-oriented development" (Chapter 8, p. 285).


However, this comes with a stern warning, "pearls" need a "necklace". TOD developments need to be connected together to create the 5th "D" - "Destination accessibility", TODs cannot be "islands in a sea of auto-oriented development" (Cervero et al., 2004).

**TODs: International best practice?**

Hong Kong's MTR Corporation (MTRC) rail authority is acknowledged as the leader in TOD developments worldwide through their Rail and Property (R+P for short) strategy over the last 30 years. MTRC is a parastal with a 23% listed public component, so profits are a big driver for the company. Cleverly, the MTRC invests heavily in development around its transit stations, using ‘value-capture’ techniques to create compact, sustainable and pedestrian orientated urban environments. The MTRC also helps fund other developers, buys in, sells development packages and manages these developments. MTRC reinvests profits into world-class transit systems which increases ridership at their stations and on their network (Cervero et al. 2008). As an additional bonus, MTRC assists the Hong Kong government to build, manage and maintain infrastructure (schools, clinics, libraries, etc) within these developments. As a result of this, the MTRC is one of the most profitable rail authorities in the world (Figures 4 and 5). They are more a property development company than a rail authority.

![Fig 4: MTR Corporation - financial results 2005 (Source: www.mtr.com.hk).](Image)
What is most significant about the figures above is that it shows transit supported property development is recession resistant, leads to high quality sustainable urban environments and supports the economic and social goals of the Hong Kong government. This is what experts call the ‘Virtuous Circle’ (Figure 6).

**Fig 5:** MTR Retail rental income vs value of investment 2012

**Fig 6:** The "Virtuous Circle" - Rail and Property (Source: courtesy TFP-Farrells HK, Cervero et al).
A prime example is MTRC’s flagship Hong Kong station. Hong Kong station (also known as the Kowloon station) comprises 19 towers, including an 118-storey Landmark Tower accommodating 231,778 m² offices, a deluxe hotel and an observation deck. A world-class shopping centre of 82,750 m², about 6,400 apartments and 5,600 parking spaces (less parking than residences, most Hong Kong residents do not own cars). Transport interchange for public buses, cross boundary coaches, minibuses, taxis, hotel shuttle and tour buses. 40,000 people live, work and play in this TOD development, so extensive public and private open space and recreational facilities are provided.

One can dismiss this phenomenon as a once off, but there are 25 R+P projects at prominent Hong Kong stations in a variety of different forms. These developments are acknowledged as some of the most valuable real estate in the world.
Fig 7: MTRC Hong Kong station - vertical and horizontal integration (Source: courtesy TFP-Farrells HK).
**SO WHAT ABOUT RETURN ON INVESTMENT?**

TOD developments use the value of the proximity to transit, quality of environment and the generated footfall to make these environments highly desirable. Typically, a significant increase in real estate value is realised.

Based on standard property values around a typical development, one can find the following trends:

- up to 8% value uplift with 800m walking radius of the transit facility (TAD)
- up to 15% value uplift within 400m walking radius of the transit facility (TOD)
- up to 30% value uplift where the facilities are tightly integrated within the transit facility (TOD R+P) (Cervero et al. 2008).

This value uplift is recession resistant and well proven.

**SO ARE THERE ANY TODS IN SOUTH AFRICA?**

A recent pioneering example is Bridge City as a PPP partnership between Tongaat-Hulett and the eThekwini Municipality (City of Durban). The concept is a new town center built along traditional urban design lines, however a potential “pearl” in crown is the Bridge City Shopping Mall, which is built tightly integrated into the PRASA\(^5\) Metrorail commuter rail station and a mini-bus taxi rank adjacent (Figure 8).

Although the development is thriving currently with just the taxi rank and the retail component, completion of the rail spur will further energise the TOD aspect of this development. The residential second phase, unfortunately, has stagnated. Current housing prices and construction costs make private residential development unattractive to commercial developers. This where government and NGO funding needs to fill the gap with social housing grants and low interest investment, even ownership. Only when all the components of live, work and play are engaged can the development be truly sustainable and the value rise above expectation.

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\(^5\) PRASA: Passenger Rail Agency of South Africa.
Bridge city could benefit from other TOD principles. A tightly integrated public space for meeting and social interaction. This is provided some way off in the new town centre, but does not contribute to the TOD environment directly as it is not integrated. Bridge city, being a pioneer TOD, suffers from a lack of accessibility to other TODs/TADs through a reliable safe integrated commuter network. However, over the next 15 years this will hopefully change with the South African government’s infrastructure recapitalisation plan.

Another recent example under construction is the City of Johannesburg’s Sandton Gautrain Rapid Rail Link station (Figure 9). Again, the project has stagnated for a variety of political and financial reasons. In its current form, further work is needed to integrate the various components of the development. Walkability into the other commercial blocks around the station with grade separation is also an issue (Figure 10). These issues will have to be addressed for Sandton station to truly become a great TOD R+P development.

http://www.transport.gov.za/LinkClick.aspx?fileticket=wp3JSA6ESdU%3d&tabid=644&mid=1568 (downloaded 28/11/12)
SO WHAT ARE THE QUALITIES OF A GOOD TOD?

Quality master-planning, urban design and implementation are crucial to a successful TOD and the capture of value. Walkability is a key aspect to the perceived value uplift of a development. To achieve walkability, the pedestrianised environment has to be carefully considered using the 5 “Ds” of TOD urban design. Qualities such as aesthetics, amenities, legibility, connectivity, comfort and natural surveillance have to be included. Examples of this in Hong Kong are given in figure 11 below.
Key considerations are:

1. **Horizontal connectivity and integration** (fully integrated station with direct, well lit, spacious pedestrian accesses and foot bridges)
2. **Vertical connectivity and integration** (motorised transport is kept at ground floor and pedestrians are grade separated)
3. **Blending retail and pedestrian corridors** (Pedestrians walk through retail areas and open parks with good signage)
4. **Amenities and openness** (street furniture, public art and pocket parks)
5. **Legibility and focus** (station is easy to "read", movement is intuitive and logical with signage and well planned urban environments)

![Images of urban qualities](Fig 11: Key urban qualities of tightly integrated TOD (Source: Image courtesy of Cervero et al).)

**TOD FUTURES IN SOUTH AFRICA?**

Given our extensive rail network, government planning policy and infrastructure development plan, housing and education backlogs, high levels of unemployment, etc. Our parastatals, private developers, NGOs and government departments are a perfect position to engage these challenges and shift our vision to a transit based society. The truly sustainable model of TOD development offers socio-economic benefits that no government can ignore. It also offers financial benefits that can take the load off the tax base and provide the shortfall of infrastructure funding required to expedite development. Private developers can then also share in the uplift and assist the government in providing crucial public services with facility management, procurement and capital funding. TODs require public and private entities unified around common goals. Land use around transit stations, housing grants, government and private investment vehicles need to be looked at to see where synergies and common ground can be found. Our Government needs to have the vision of the future for our urban environment, not only looking at engineered riderships, catchment areas,

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land use zonings, but boldly striking out in the right direction one project at a time, and not necessarily based on rational catchment area analytics. "What the public sector needs to do is "prime the pump"...once that happens, developers notice the smell of money...profits are good, so they want to do more projects...cities realise that it will expand the tax base...etc. You eventually create the kind of momentum that sustains on its own energy" (Prof. Robert Cervero, director, University of California Transportation centre).\(^8\)

**REFERENCES**


\(^8\) http://www.youtube.com/watch?v=UKEuvNeD9hw (downloaded 24/11/2011)
IN-CONTEXT AND ECOLOGY IMMERSION FOR RESILIENCE: AN EXPLORATION OF THE DESIGN OF A HOUSEHOLD FARMING KIT

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Abstract

Human-Centred Design proposes the method of In-context Immersion or meeting people where they live, work and socialise as a method to gain new insights and opportunities for the designer (IDEO, 2013). This method, as per the majority of empirical research, tends to simplify complex situations in order to provide a set of criteria that can then guide a design intervention to such problems. This paper explores how it is important to not only understand the contextual situation of a problem, but also a much broader range of contexts and influences which constitute the ecology of the problem. Ecology Immersion can be defined over and above the designers’ immersion into a specific context by the further discovery and exploration of other connected contexts. The designer is able to map a broader system by immersing her/himself in these interconnected contexts and hence foreseeing how a proposed intervention could interact in the greater ecology of the problem. An example could be the effect the seemingly independent biological system and economic system could have on a small-scale agricultural project. This improved understanding then allows for the design intervention to have a better foundation in terms of the systems it relies on, which potentially aids the final intervention’s resilience. This paper explores and criticises the design process of a household farming kit as an example of such a method. This critique will offer potential insight into future applications of this method in the field of Industrial Design and its potential application in other design disciplines to encourage greater resilience.

Keywords: In-context immersion, ecology immersion, industrial design, small-scale agriculture, food security, design for social development, social impact design, Johannesburg.

INTRODUCTION

Social impact design, or design for public good that is socially, environmentally, and economically sustainable, is clearly gaining traction in design education, research and practice (Smithsonian Institution 2013). As this mode of design expands, design methods focused on such endeavours need to be tested and refined. This paper firstly explores the method of In-context Immersion as utilised by various design practitioners under a variety of guises as an attempt by designer/s to better understand the people they are designing for or with, especially when designing for marginalised communities (IDEO 2011, pp. 46-47; Polak 2009, pp. 15-17 and Martin & Hanington 2012, p.60). This method, as adopted by many practitioners, is criticised by the authors as taking too narrow and reductionist a view in relation to the complex economic, social, cultural and political realities experienced by the majority of people from communities where such design is taking place. The paper then explores the systemic nature of problems in terms of their broader ecology and the proposed method of In-context and Ecology Immersion is then explained. The combination of In-context and Ecology Immersion is explored in relation to a research project, the Design and Development of a Household Farming kit (Brand 2014) (Figure 1). The paper then concludes that such a method provides the opportunity for greater resilience for both the design intervention and those who will rely on it.
IN-CONTEXT IMMERSION

In the Human-Centred Design Toolkit developed by the design and innovation consulting firm IDEO, the method of In-context Immersion is advocated as a method which design practitioners can adopt in order to “...understand the people they are designing for not just on an intellectual level, but also on an experiential level” (2011, p. 46). This understanding at a level of personal experience is intended to allow unexpected opportunities or new insights to be revealed. This is in contrast to the preconceptions brought into any context where a designer is designing for someone else. In-context Immersion can be defined as immersing oneself in the context in which the design intervention should operate. This often means that the designer would seek to experience the typical conditions that the final user of the intended design intervention would experience. In Figure 2 one of the authors is seen conducting a focus group with Jeffery Hughes and Willem van Zyl at their farms in Noordgesig, Soweto. Conducting this interview on their farm allowed for a two-way immersion, that of the author in the farms environment and the farmers’ immersion into the conceptual world of the designer. During such a focus group, the farmers could physically identify issues in their environment and demonstrate their points of view without feeling alienated by an unfamiliar context. These focus groups drew attention to aspects the author did not notice during previous immersive experiences.
The process of In-context Immersion has become a fundamental building block in most participatory design practice. The design practitioner often assumes a visit to the location of the participants as non-negotiable, especially in socially orientated design projects where the designer and participant come from vastly different socioeconomic contexts. Relating to the authors’ project, since the design intervention was for farmers, the designer needed to visit their farms. This is in line with what Paul Polak suggests when he describes two of the steps in his guide to practical problem solving: “2. Talk to the people who have the problem, and listen to what they say” (2009, p. 15-17) and “3. Learn everything you can about the problem’s specific context” (2009, p.17).

In-context Immersion is similarly termed Design Ethnography by Bella Martin and Bruce Hanington in their book, Universal Methods of Design (2012, p. 60). They describe this method as an approximation of the immersive methods of traditional ethnography, which encourages the designer “…to, deeply experience and understand the user’s world for design empathy and insight” (ibid.). Design Ethnography differs from ‘true’ Anthropological Ethnography in that the designer is seeking time-sampled observations and behaviours. These experiences can be sought through “the experience sampling method, diary and photo studies, cultural probes, contextual inquiry, and various forms of observation, including modified versions of participant observation” (ibid.).

This pervasive adoption of In-context Immersion might be attributed to the development and wider acceptance of user-centred design methods amongst design practitioners (Smithsonian Institution, 2013). The extent to which designers actually immerse themselves and their intentions behind such projects have led to some criticism by the targeted population of what could be considered a new imperialism through design (Nussbaum 2010) or ulterior economic motives hidden under the banner of charity (Arad 2012). This debate will likely continue as ‘Social Innovation’ continues to become more mainstream. Indian industrial designer and academic Singanapalli Balaram highlights how it is not only the people one is designing for that the designer needs to take cognisance of, but also the economic, social, cultural and political realities of a country (Balaram 1998, p. 3). He states that, “the design activity of any country cannot be well understood without knowledge of the context in which it operates.” This extends the notion of a possibly too narrow in-context immersion to a broader immersion into the ecology of the context.
THE ECOLOGY OF PROBLEMS

A greater capacity to access and acquire knowledge as a result of rapid increases in communication technologies in recent years has led to a far more nuanced understanding of problems. Seldom, if not ever, can a problem be considered finite and isolated. “I have yet to see any problem, however complicated, which, when looked at in the right way, did not become still more complicated” (Anderson cited in Meadows 2008, p. 11). Problems, like the people they affect, are always interconnected and highly complex. Richard Buchanan in his discussion on Rittel’s description of wicked problems explains that, “Design problems are ‘indeterminate’ and ‘wicked’ because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience. But in the process of application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances” (1992, p. 16). This highlights the need of the designer to define a problem's boundaries, but in too narrowly defining a problem a designer can easily miss important considerations for the long term resilience of a design intervention.

Problems are systemic in nature, leading to not only a difficulty in understanding them, but also in solving them. Donella Meadows, in her book Thinking in Systems (2008) explains, “A system isn’t just any collection of things. A system is an interconnected set of elements that is coherently organized in a way that achieves something” (p. 11). This systemic nature of problems refers to their interconnection with additional sets of elements, these elements could include other problems or other contexts that are connected and therefore also affected by the problem at hand. Often if carefully investigated, any problem presents a very deep and complex array of not only elements that are interconnected, but also additional interconnected systems. This array of systems with interconnected elements is seldom static, but rather dynamic and continually changing, hence the indeterminacy of wicked problems (Buchanan 1992, pp. 15-16).

The word ecology has been chosen by the authors to capture the dynamism of the systemic nature of problems. This word, ecology, is typically associated with the description of natural systems, especially highly complex systems. As an example of a highly complex system, Meadows describes human beings, “We are complex systems - our own bodies are magnificent examples of integrated, interconnected, self-maintaining complexity. Every person we encounter, every organization, every animal, garden, tree, and forest is a complex system. We have built up intuitively, without analysis, often without words, a practical understanding of how these systems work, and how to work with them” (Meadows 2008, p. 3). Although Meadows describes the human body as a complex system, systems of a similar nature are termed as ecologies in this paper in an attempt to encapsulate their dynamic nature.

Understanding the ecology of any problem in order to bring about considered change, as in any good design intervention, is crucial. This is important in order that the design intervention is well considered and the resulting change is a beneficial disruption to the current system. When addressing problems with designed solutions one needs to be cognisant of the systems on which the designed solution would rely. This has implications in terms of resilience (unpacked in the following heading) on both the design intervention and those relying on it (Campbell & Brand 2012, p. 281). Without cognisance of the ecology that accompanies a presented problem, the problem itself is not defined, making it impossible to solve effectively without pure luck, which should not be encouraged.

The ecology of a problem is very vast and complex, this makes it difficult to understand and take account of. However a designer attempts to explore the current ecology of a system, the greater their understanding and the more poignant and effective any designed disruption can be. Even doctors specialising in a specific field of medicine are required to study and understand human anatomy as a whole. So even though one could not legitimately claim to comprehend the full ecology of a problem, one could have a relative comprehension, and the broader the better. To develop this, one needs to understand the elements connected within the ecology, since the ecology itself is intangible without its parts. This would require an in-context immersion into the different elements within the ecology. Typically user-centred design practitioners would inherently visit the immediate, obvious, context to which the design intervention is linked. However, there are many other elements which also play an important role in the design intervention’s existence and these interconnections require consideration. In other words, the exploration of additional in-context immersion experiences in order to understand “not only at an intellectual level, but
also at an experiential level” (IDEO 2011, p. 46) each of these different elements. This is what is defined in this paper as Ecology Immersion.

The danger in only immersing oneself in the immediate, obvious context is that this results in a potentially finite understanding of a problem from the viewpoint of the end-users. Often to solve a problem in the longer term, one needs to have a broader understanding of the ecology in order to change the broader system/s that the designed intervention relies on. It may be these system/s that need to be changed since this is what could have led to the original problem in the first place. Solving only the problem and not altering the system/s could result in the problem being solved for a finite period, but then the same or a similar problem being replicated by the system/s that incurred the original problem. Robert Pirsig explains that “...if a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a systematic government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves in the succeeding government. There’s so much talk about the system. And so little understanding” (Pirsig 1974, p. 94). It is this broader understanding that the method of Ecology Immersion aims to seek out. This enables broader systems to be altered, to solve problems not only in the finite manner but also in the long term and hence become more resilient.

RESILIENCE

“Resilience is the capacity of a system to experience shocks while retaining essentially the same function, structure, feedbacks, and therefore identity” (Walker et al. 2006, p. 2). Resilience can refer to a number of different entities, from people and communities to biological systems, economies and governments. Resilience in this paper refers to both a design intervention as a physical product, as well as the resilience of the people relying on the product. The resilience of a product can have a major influence on the resilience of people or communities because of their reliance on it (Campbell & Brand 2013, p. 281). The ecology of problems as explored above is related to what can be termed the ecology of a design intervention. When a design is ‘inserted’ into the ecology of the problem in order to bring about change, it becomes an element in the newly readjusted ecology. If this design intervention is not resilient itself, it becomes a point of vulnerability for not only the entire ecology but also creates a point of vulnerability for the people using it, thereby possibly compromising the resilience of both the people and the ecology/system (Campbell & Brand 2013, p. 281).

“A diverse system with multiple pathways and redundancies is more stable and less vulnerable to external shock than a uniform system with little diversity” (Meadows 2008, pp. 3-4). In the same way, this can be applied to products. For example, a product’s ecology includes its manufacture, distribution network, functions, market and so on. If these are diverse and multifaceted the products ecology is more resilient, resulting in a more resilient product, and hence a more resilient broader ecology, ultimately resulting in a more resilient end-user. Resilience is critical for marginalised people and communities, since any disruption that is not recovered from quickly can lead to more disruptions, which could put the community in a position that compromises not only their current, but future wellbeing as well (Pasteur 2011, p. 15).

In order to understand the practical application of In-Context and Ecology Immersion to enhance resilience in design interventions, the rest of the paper unpacks the design process of a household farming kit undertaken by the authors over three years (2011-2014).

IN-CONTEXT AND ECOLOGY IMMERSION IN PRACTICE - A HOUSEHOLD FARMING KIT

Small-scale farming falls under the broader context of food security. Food insecurity is a global, national and community problem, which is highly complex and multifaceted (FAO 2008). When approached from the level of practical impact, Ian Smillie outlines various systemic issues that unfolded during the development and commercial sale of product to impact on food security in Tanzania: “When the project was conceived, most oil was imported; prices where high and availability was a problem. By 1986, however, after the equipment had been developed and the cost of the technology was more or less fixed, import restrictions were lifted, and the prices of oil fell. Fortunately this did not seriously affect the profitability of the press, but
it signalled a problem frequently ignored in the development of appropriate technology” (Smillie 2008, p. 133).

In the example above, the systemic nature of the problem, the design of an oil press, is clearly more than just the oil press itself, but extends to the Tanzanian government’s import policy and how that impacts on the oil press’s commercial viability. Meadows provides insight into problem solving on a range of scales, she explains that many serious problems, such as food insecurity, have attempted to be solved by “focusing on external agents” (2008, p. 4) and have led to the creating of further problems. “Hunger, poverty…, for example, persist in spite of the analytical ability and technical brilliance that have been directed toward eradicating them. No one deliberately creates those problems, no one wants them to persist, but they persist nonetheless” (ibid.). The issue is that these sorts of problems are “intrinsically systems problems” and can only be solved by acknowledging “the system as the source of its own problems, and find[ing] the courage and wisdom to restructure it” (ibid.).

In order to understand the systemic problem of food insecurity in Johannesburg, the methods of In-context and Ecology Immersion were utilised in a Masters project undertaken at the Department of Industrial Design in University of Johannesburg titled Design and Development of a Household Farming kit (HFK) (Brand 2014). The project built upon a previous mini-dissertation project which also explored the development of small-scale agricultural equipment. The Masters project aimed to develop a farming kit consisting of a set of basic equipment for a small-scale farming. The problem identified with existing kits was that they were not designed as a considered whole but were rather a collection of tools purchased from suppliers. On occasion these tools overlapped in function and/or were not considered in accordance with the desires and needs of the farmers who they were given to. The farmers often simply accepted the tools without question since they received them for free and as the common English saying goes, “no one looks a gift horse in the mouth”. The HFK aimed to not only provide the farmers with better, more appropriate equipment but also provide lower-cost better targeted equipment that functioned as a holistic kit. This more considered kit could then be provided by NGOs and governmental organisations to more farmers (i.e. more kits) for the same price that the existing kits were being purchased for. The initial concept of the kit consisted of: a greenhouse which provided farmers with the advantage of crop protection from hail and insects, and an extended growing season; a multifunctional hoe-tool, which would assimilate a hoe and spade into a single hand tool; seeds for planting; and an instruction booklet to provide the farmers with sufficient knowledge to use the kit. This paper focuses specifically on the method of In-context and Ecology Immersion as it proceeded during the design development of the HFK.

When the project began the study wasn’t well defined, so potential partnerships were sought to better identify and establish its direction. This led to networking opportunities and contact with many organisations and groups who were also undertaking work in small-scale agriculture. This developed into the first context in which the researcher was immersed, that of similar stakeholders. This networking enabled the researcher to become better known within the local community of those working within the realm of small-scale farming and food security. A number of workshops were attended which helped develop further opportunities for immersion. Local food markets as well as a range of small-scale farmers were visited as the project began to take shape. For example, a visit was made to Mr dos Santos (Figure 3) a home food gardener who grew vegetables since he was not able to purchase the varieties he preferred from retailers. He had developed an extensive garden growing a wide variety of vegetables in a small area and much knowledge was garnered from his expertise.
As the project began to take shape, an additional multi-stakeholder partnership was established between the authors, the local Food and Agricultural Organisation of the United Nations (FAO) and the Balimi Food Security Company (BFSC). This relationship was instigated by the authors after visits to the FAO seeking a potential partnership and it was the FAO that connected the BFSC and the authors. The BFSC then invited the authors’ to a site tour as part of a stakeholder meeting they were hosting. The BFSC asked for assistance with presenting and communicating their own project and this together with the authors’ project was presented to a number of interested parties including officials from the local government office. This became the first of many partnered presentations to high level government officials such as the Department of Rural Development and Agriculture, as well as commercial entities such as the Senwes agricultural company (http://www.senwes.co.za/). These repeated presentations allowed for the researchers’ greater understanding of the context of NGOs and governmental organisations.

It soon also became evident that it would be helpful to also start personal experiments with vegetable growing in order to be able to speak from experience with the farmers working on the project. Using limited space, a series of box gardens allowing for a range of vegetables to be grown were started at the researcher’s home (Figure 4). This not only gave the researcher an empathetic connection to participants, who were engaged during in-context immersion when visiting the participants in their own contexts, but also allowed for the immersion into the context of home vegetable growing. This in turn led to other opportunities linked to home gardening projects.
The next context for immersion was with the farmers themselves who would be the users of the farming kit. A series of prototypes were developed and tested by the farmers themselves. The greenhouse for example, needed to be set up on the farms by the farmers and was not simply delivered pre-assembled. This resulted in the researchers working with the farmers in its setup; on occasion this meant first assisting the farmers with current tasks they were busy with before beginning. During this time, informal conversations with the farmers encouraged an extended empathetic understanding of their context.

In addition to the immersion with the farmers and the immersions into other interrelated contexts explored above, the researchers were also following current literature on small-scale agriculture in both Johannesburg and abroad. This once again expanded the broader understanding of the ecology of the problem of food insecurity.

All these different contexts into which the authors were able to immerse themselves to different degrees, with differing stakeholders and in different environments led to a greater understanding of the broader context and system of food insecurity and small-scale farming in Johannesburg. Initially this method began merely as partnership seeking, but after a number of immersive experiences the value of such a method became apparent. This led to a more focused and applied application of what has been described in this paper as In-context and Ecology Immersion. In a sense, this method developed organically as the project progressed, but its value became evident from the greater understanding of the ecology of the greater problem and it was therefore pursued with a greater sense of focus and intention.

The opportunities for immersion were initially sparse, but as the project progressed they became ever more available. Initially any opportunity to be immersed in a context which was interconnected within the ecology of food security was seized. However, as many more became available the researchers had to be more selective and also focus more directly on the context where the final design intervention of the household farming kit would operate. In Figure 5, the green squares represent different contexts into which the authors were immersed. In the initial stages, a number of contexts are examined through immersion, but as the project progressed, exploration could only be sought in selected contexts in order to arrive at a conclusion. There is also a bulge later (moving from left to right) in the diagram which aims to describe a period when further contexts were sought and examined in relation to a more defined design intervention. In this case, this was the examining of different manufacturing methods and the testing of various options for the
prototypes manufacturing. The largest extended green block (running the length of the diagram) represents the end-users, in this case the farmers, and their context for the design intervention. This is shown as a continuous line, although it is made up of a large number of shorter immersions, since the in-context immersion is an experience that extends into the psychological and intellectual realm of the designer and end-users even though physical contact may not be maintained during the entire period. After a number of in-context immersions, the ecology of the problem was better understood, which led to more considered design decisions in terms of the greater system relating to the implementation of the household farming kit. These decisions included the choice of materials and manufacturing methods used to develop the tools in the kit; the decision to promote natural farming methods; the adoption of a subsurface irrigation system in order that the farmers did not till the soil repeatedly, thus encouraging low-tillage farming.

Figure 5: Multi-context outline in terms of time.

"Conway and Barber define [agricultural sustainability] as 'the ability to maintain productivity, whether of a field or farm or nation, in the face of stress or shock'. The stress might be small or large, temporary or permanent. It could be the result of local factors, such as drought, flood or grasshoppers or it could come from external forces such as an increase in the price of fertilizer or the withdrawal of technical support. "Sustainability thus determines the persistence or durability of a system's productivity under known or possible circumstances" (Smillie 2008, p. 118). In order that the household farming kit promote agricultural sustainability it was considered in terms of its local ecology and the greater ecology of food security. This was undertaken by reducing the price when compared to existing offerings (the kit cost approximately half that of existing kits); designing the elements so that they can easily be replicated and repaired using local artisanal skills (observed and investigated during various in-context immersions); and designing the equipment to fit the specific needs of the farmers together with them, thereby reducing its potential for redundancy."
Phillip Oosthuizen, an industrial design academic, proposes the following factors that all good designs should consider (Interview 20 March 2014):

- **Use** - How the design functions. Is it usable, does it consider the person who would operate it?
- **Manufacture** - How the design is made. What materials to choose, are they repairable, what skills or machinery are required for the making of the product?
- **Business** - How does the design make business sense? Is it cost effective and efficient?
- **Environment** - What impact does the design have on the environment? Is it environmentally sustainable?
- **Society** - What impact does the design have on society? Is it a socially considered solution?

Different design projects and design interventions would inherently have a different balance of consideration for each. These factors of design can act as a good guide for the types of contexts that needs to be considered in order to develop an understanding of the greater ecology of a design problem. In the example of the Design and Development of a Household Farming Kit each of these were explored in-context through immersive experiences: the use of the kit in relation to the farm, the farmers, their households and small-scale farming; the manufacture by developing a series of prototypes and by experimenting with different manufacturing techniques for different elements of the kit; the business by interaction with NGOs and governmental organisations; the environment through various workshops, as well as seeing and studying a variety of different farming practices; and lastly society through a multi-stakeholder approach to the entire project.

Adopting a method of In-context and Ecology Immersion helped develop a richer understanding of the different interconnected contexts related to small-scale farming. This gave the designer a great advantage in terms of both opportunities for the design, but also in considering potential vulnerabilities in terms of the greater ecology in which the design would function.
CONCLUSION

This paper has discussed In-context Immersion as a method of gaining empathy for a problem context, but also unpacks the benefit of understanding the systemic nature of problems and hence the further methodological development of Ecology Immersion. “To have to grapple with divergent problems tends to be exhausting, worrying, and wearisome” (Schumacher 2011, p. 78) but by immersing oneself into many interconnected contexts one develops a tacit understanding of the ecology thereby putting oneself in a better position to design a well-considered, resilient product.

Systems thinking and multi-context approaches to design are not original. However, the increased popularity of social impact design has led to many practitioners diving into an immersive experience with the end-users of a product/system potentially at the expense of considering the other interconnected contexts, and thereby the ecology of the greater system. In this lies the potential that the design only effectively addresses the problem in terms of the current context of the end-users at the expense of a changing broader ecology, hence limiting the solutions resilience. By defining and proposing In-context and Ecology Immersion the authors aim to remind designers to consider the greater ecology associated with problems they are trying to solve. This in turn should result in more resilient and sustainable products that limit the points of vulnerability for their users.

ACKNOWLEDGEMENTS

This work is based on the research supported in part by the National Research Foundation of South Africa for the Thuthuka grant held by Angus D. Campbell titled Designing Development: An Exploration of Technology Innovation by Small-scale Urban Farmers in Johannesburg. Any opinion, finding and conclusion or recommendation expressed in this material is that of the authors and the NRF does not accept any liability in this regard.

REFERENCES


ACCESSIBILITY AND HERITAGE IN ITALY

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Abstract

Italy, like most European cities, has a great number of Heritage sites: not only buildings, but entire ancient cities and archaeological sites of great significance. Individuals should be enabled to fully enjoy these sites, despite the fact that their morphological and architectural features often cannot easily afford it. However, the presence of architectural barriers characterises all architecture and landscapes representing the world’s historical and cultural Heritage. Accessibility and usability must be faced taking into account each unique context: the specific features and qualities of the historical, cultural and natural landscape; the legislation; and the several technical and structural constraints peculiar to the project. Several examples of successful interventions “for All” in Italy are presented in this paper with a special focus on touristic sites and interpretative museums aimed at improving the use and enjoyment of historical Heritage sites by everyone, including people with disabilities and children. This paper also questions some of the assumptions surrounding the aesthetics of accessible and Heritage architecture and searches for a possible middle ground: the possibility to design solutions which meet expectations for both accessibility and high quality “architecture” and “design”. We will also illustrate the commitment of the city of Venice: it is a particularly interesting case study, in a true open-air museum. The paper’s outcomes demonstrate that the accessibility project does not stop inside a single building but embraces a broader vision, thus offering an integrated Heritage experience for the widest possible range of people.

Key words: sustainability, accessibility, Design for All, Heritage

INTRODUCTION

Italy, like most European cities, has a great number of Heritage sites: not only buildings, but entire ancient cities and archaeological sites of great significance. All individuals, even people with reduced mobility or perception, should be enabled to fully enjoy these sites, although this could be difficult due to the morphological and architectural features of the urban settlements and of the built or natural environment. This approach stems from the principles of social sustainability and social inclusion and non-discrimination, as the effort towards a good quality of life for everyone: every architect should base his activity on this approach.

However, full accessibility often appears a difficult, or even impossible, achievement: frequently, entire towns appear virtually inaccessible due to geological or topographical conditions. A more realistic goal, in many cases, is to ensure everyone enjoys a concrete urban visitability. Our main aim must be to design in a way that makes the experience of enjoying the landscape/architecture interesting, attractive and meaningful for all. According to the definition adopted by the European Commission (DG Employment and Social Affairs, European Day for People with Disabilities 3rd December 2001), “Design for All means designing, developing and marketing mainstream products, services, systems and environments to be accessible by as broad a range of users as possible.”

This approach has also been developed in the US since 1997, when a group of designers and researchers from NCSU (North Carolina State University), coordinated by Ron Mace, created the US Centre for Universal Design and developed the Principles of Universal Design to guide the design of places, products and communication systems.

Lack of accessibility in many Heritage Sites

The presence of architectural barriers characterises all architecture and landscapes representing the world’s historical and cultural Heritage. In this respect, a great debate has spread worldwide, that focuses on the possibility to achieve accessibility without compromising the aesthetic peculiarities of Heritage sites.
The following examples show how difficult the achievement of “complete accessibility” in and around the sites can be. Let us think about Ischia Island, Gulf of Naples, Southern Italy. It is a volcanic island (46 square kilometres), almost entirely mountainous, whose highest peak is Mount Epomeo (788 meters). Its irregular coastline and inland and its deep slopes make the usability of services and attractions seriously difficult. Another example is represented by the ancient town of Matera, Basilicata, Southern Italy, known as Sassi di Matera: it is one of the most ancient settlements in the world, and is listed as a UNESCO World Heritage Site. Its buildings have been dug from calcarenite and it lies next to a small canyon that has been eroded by the small stream Gravina, which separates the area in two and culminates in the rocky spur of the Civita (the ancient town). Due to morphological reasons, many Italian villages are not easy to visit on foot by people with motor disabilities. Artena, near Rome, is a Roman village within the Lepini Mountains, perched on a calcareous rock; it has a rugged morphology with more than 40% slopes and recurring Karst phenomena that create numerous dolines and pools.

Figure 1: Piazza di Spagna and Trinità dei Monti. Rome (Source: Studio Steffan).

Piazza di Spagna and Trinità dei Monti in Rome is one of the most famous Italian landmarks whose main element is the majestic staircase – obviously not usable by all visitors – inaugurated during the 1725 Jubilee, and culminating in the Trinità dei Monti church. Although the church can be reached in different ways, and also by car, only the route going from Bernini’s baroque fountain, through the staircase (which is often full of flowers) up to the gothic church, allows the visitor to fully enjoy its beauty: the visual experience can be connected in this way with the acoustic (the fountain and its water) and olfactory (the flowers) experience and with the movement (Figure 1).

At the Museum of Castello Sforzesco in Milan, after a long tour pathway, from the top of a wide staircase visitors can spot a niche, that hides the sculpture Pietà Rondanini by Michelangelo. People with motor impairments can ask for a guide and follow an alternative path, by lift; in this way however an important part of the visit, the emotion of the discovery, is lost.

Stairs seem to be the worst enemy of accessibility and in the perception of many architects it seems that ramps have been introduced in architecture only to help people with motor impairments, according to the technical legislation for the elimination of architectural barriers. Actually, in great examples of architecture, mobility is a determinant factor to understand them: think about the Promenade Architecturale in Villa Savoye by Le Corbusier (1929) and the church by Michelucci (1963) on “Autostrada del Sole” (the main Italian motorway) in Florence, in which the pathway is both an architectural and spiritual experience.

Nevertheless, it is reductive to think that accessibility can be connected only with mobility even if in conditions of autonomy and safety, and not to the whole emotional enjoyment and fruition of the
environment. The pleasantness, the emotion that generates a place or an environment is a determining factor of good architecture.

To guarantee accessibility of the built environment does not only mean the possibility to overcome a gap or a passage (a step or a narrow door); it means connecting architecture to movement, giving also to people with motor impairments the possibility to enjoy the architectural artefact, be it an ancient or modern site, a restored or new building. Accessibility can therefore be an aesthetical–architectural value, as well as a socially undeniable value.

Accessible Heritage sites: the first sustainable step towards the right to culture

In order to work for the improvement of accessibility, particularly in Heritage sites, the main references are represented by the principles stated by the United Nations Conference on Environment and Development (UNCED, Rio de Janeiro, 1992), where the idea of sustainable development had been shared, based on the “three pillars” of sustainability – environmental, economic, social; and by the principles of social inclusion and non-discrimination, enshrined in the Universal Declaration of Human Rights (UDHR, UN, Paris 1948) and in the United Nations Convention on the Rights of Persons with Disabilities (CRPD, UN, New York 2006), as well as the European Landscape Convention (Council of Europe, Florence, 2000, ratified by Italy with law n. 14/06).

Nowadays society is strongly directing its efforts towards energy conservation, which is an unavoidable objective for designers. The concept of sustainability should go beyond energy conservation and lead towards a sort of “widened sustainability”: environmental, economic, social. Sustainability and social inclusion should guide the actions of professionals in the field of architectural design, products and services. European architects are used to adopting dimensional standards for the design of life and work spaces. Leonardo’s Vitruvian Man as well as Le Corbusier’s Modulor are usually and all along considered the main reference points for designing, even though they constitute ideal models, that cannot represent the diversity of humankind.

As a matter of fact every person is different from another and, furthermore, everybody is different from himself, during his own life, due to physiological, personal and pathological causes. A paradigm change is therefore needed, since an ipothetic standard man or at least some specific human categories cannot be the reference for the design of public environments.

A good project, if sustainable, should take into account the widest spectrum possible of potential real users and aim to create accessible and usable solutions for the greatest number of people possible. Starting from sharing this approach, the Universal Design/Design for All philosophy is increasingly spreading both at international level and in Italy. It represents a User-Centred Design approach whose main aim is social inclusion: it is based on the acknowledgement of human diversity as a value and it is the design for real persons, with differentiated solutions that are socially, economically and environmentally sustainable. UCD refers to the definition by J. Rubin (1994) according to whom “User-Centred Design not only represents the techniques, processes, methods and procedures necessary for verifying and designing the usability of the products and systems, but also and above all, an intervention philosophy that places the user in the centre of the design and creation process of the products”.

Referring to the architectonic and landscape cultural Heritage hosted in our cities, often composed not only by individual monuments or artefacts but by entire cities and archaeological sites, we need to take into account that the right to access this Heritage and to enjoy the experience of cultural education should be guaranteed to everyone.

In the aforementioned European Landscape Convention (Council of Europe, Florence, 2000), the term landscape is defined as an area or a territory, as perceived by its inhabitants or visitors, whose aspect and features stem from the action of natural and/or cultural (i.e. anthropic) factors and their interrelations. This definition considers the idea that landscapes (the whole territory) evolve in the course of time, due to the effect of natural forces and human actions. It underlines the idea that landscape gives shape to a whole, whose natural and cultural elements are simultaneously considered.

Urban spaces and their Heritage elements are in the first place one of the main vehicles of national identity
construction by citizens, representing the concrete evidence of a cultural identity and an element of personal and social growth.

Subsequently, many Heritage sites constitute a strong tourism attraction, to the extent that every city can spread its own image that can be perceived as unique, unrepeatable, as well as accessible for potential tourists.

The Colosseo in Rome can be mentioned as an example. The Colosseo has been declared among the Seven World Wonders, it is the world biggest amphitheatre, representing par excellence the icon of Italy and of Roman vestiges, besides being Italy’s main tourism attraction with more than five million visitors every year. In support of this idea, several European nations have recently introduced general and technical legislations for accessibility in Heritage sites. In Italy, the principles expressed in Codice dei Beni Culturali e del paesaggio – Code of Cultural and Landscape Heritage (D.L. n.42/2004) have been specified in: Manifesto della Cultura Accessibile a Tutti – Document for Accessible Culture for All (in implementation of art. 30 CRPD, UN, New York 2006, ratified by Italy with Law n.18/2009) and Linee Guida per il superamento delle barriere architettoniche nei luoghi di interesse culturale – Guidelines for overcoming architectural barriers in heritage sites (MIBACT – Ministry of Cultural Heritage and Activities and Tourism, 2008).

The Italian Code of Cultural and Landscape Heritage includes the concept of cultural Heritage, which is defined in art. 6: “Valorisation means to exercise the functions and to discipline those activities that are aimed at the promotion of the knowledge of the cultural Heritage and to ensure the best possible ways of using the Heritage itself by the general public, also by people with disabilities, in order to promote the development of our culture”.

The concept of public use of cultural Heritage, which is wide in the Code (“even people with disabilities”), expresses the need to make it usable by the widest possible audience. The recent Guidelines for overcoming architectural barriers in heritage sites by the Ministry of Cultural Heritage and Activities and Tourism also stresses this need.

The design for the requalification of cultural buildings and spaces should therefore always take these fundamental principles into consideration.

**Accessible design/requalification: some good practices**

The keystone of ergonomic and accessible design is the user-centred approach and the design compatible with different needs. Design solutions should therefore allow individuals to have access to culture or – better – to enjoy the landscape, architectural and historical beauty.

Due to the morphological and structural features of Italian and European urban contexts however, the requalification for accessibility cannot always and necessarily aim to the achievement of full accessibility for All. The main dilemma is represented by the contrast between the necessity to protect the whole Heritage and its aesthetic, and the requests to improve accessibility.

Let us consider towers, for instance the leaning tower of Pisa. It is the bell tower of Santa Maria Assunta Cathedral (56 meters), whose tilt had been caused by the ground subsidence in the early construction phases. The visit requires a great physical effort, due to the narrow helicoidal internal staircase, with its 300 steps. Designing solutions for the accessibility of people in wheelchairs is a difficult challenge: due to the tower’s morphological and structural constraints, any modification could alter its nature and peculiarity.

The issue deals with design and implementation of solutions which can satisfy accessibility needs, where possible, at the same time preserving a high quality architecture and design. Is it possible to design and realise solutions which meet expectations for both accessibility and high quality “architecture” and “design”? In the search for mediation between the original intervention and the new one, a further issue appears: the relation between the two interventions and the choice to intervene with a homogeneity or contrast project, evaluating the possibility to mark a clear formal distinction between the existing architecture and the modern intervention.

Should we always design adopting minimal interventions, or can we also propose solutions that stray away from the historical formal and aesthetic context? Must we always make a clear distinction between the original and the new?
Italy is nowadays still at the beginning of a long process: the follow explanatory examples illustrate some recurring issues.

**Figures 2-3:** Colosseo, Rome (Source: courtesy of Maria Agostiano).

In Rome, the possibility to visit Colosseo is available also for people in wheelchairs or with motor impairments. Hundreds of tourists use two lifts that connect the ground floor to the first floor, and that are invisible from the outside (Figures 2-3). Due to the Heritage context, a transparent, modern, solution has been chosen: they are made of steel and glass.

**Figures 3-4:** Mercati di Traiano, Rome (Source: Studio Steffan).

At Mercati di Traiano, practicability and accessibility of the site have been improved through the use of walkways, ramps, parapets, an oil-pressure lift, two lifting platforms (Figures 4-5). The external lift is brickwork, looking similar to the old roman walls. It is easy to recognise the modern intervention also because the new bricks differ in size from the old ones. Problems with the ancient irregular roman floor still remain.
Figures 5-6-7: Portico di Ottavia, Rome (Source: Studio Steffan).

At Portico di Ottavia the restoration intervention of the site has been done so as to overcome the difference in levels, by creating an archaeological path that goes under the Teatro di Marcello, and to the opposite site by adding an accessible rope bridge (Figures 5-6-7). The ramp going down to the excavation area features a guide line for the orientation of blind people, realised using the local material – basalt – in different ways.

Figures 8-9: Ostia Antica, Rome (Source: courtesy of Maria Agostiano)

In the archaeological site of Ostia Antica, itineraries are integrated with 3D tactile maps: a necessary solution for blind visitors and a tactile experience for All (Figures 8-9).

At the Museum of Santa Giulia in Brescia, Northern Italy, the restoration of Domus Ortaglia for accessibility purposes has consisted in the realisation of a pathway through an elevated walkway: the flat path runs along the archaeological area, protecting its integrity and ensuring an easy fruition for All (Figures 10-11). Furthermore, this metallic footbridge clanks at the passage of visitors, allowing them to perceive the difference with other floors in a multi-sensorial way.

In order to ensure usability “for All” of Heritage sites, it would be appropriate to re-design spaces considering not only the elimination of architectural barriers, but also expanding the perspective toward solutions for the improvement of orientation and information for All, starting from the needs of people with sensorial disabilities (Moore, 2013).

The strategic spatial organisation aimed at the orientation but also at the realisation of sensorial routes and inclusive contents are the main elements for both the creation of urban tactile orientation routes, like in Florence and Rome, and the realisation of structures like the Omero Tactile Museum, now hosted in the Mole Vanvitelliana in Ancona.

In Florence, printed and on-line tourist guide books called “Vivere Firenze” have been created (www.comune.fi.it/viverefirenze/itinerari.html), both in Italian and English: they list urban itineraries that are accessible for tourists with motor disabilities and other supplementary information about the tactile and sound elements needed for the orientation of people with sensorial disabilities. For instance, fountains and sculptures located on the edges of the streets are indicated as useful elements for orientation.

It is worth to notice that architects can adopt six different codes to give useful information about the surfaces of urban routes: not only the difference in height but also sign, color, size, assembly, manufacture and material.

Some routes in Rome, especially the path between Fontana di Trevi and Pantheon are equipped with tactile guides at foot level and information boards, as well as some ischiatic support benches; a path starting from S. Paolo Fuori le Mura underground station and its homonymous basilica has been equipped with foot-tactile guides and tactile and Braille information boards.

Accessibility is also the possibility to explore the environment and at the same time enjoying the experience. In Italian museums guided tours, audio guides, the possibility to touch the archaeological finds, bi-three dimensional maps of the building, of the rooms, of the works are often used. Sometimes, it is also possible to manipulate and reproduce a work in special educational workshops.

In Italy, the Omero Tactile Museum makes tactile experience the focus of its activities and research: touching faces, bodies, gestures, expressions, discovering volumes and perspective through the hands.
The Omero Tactile Museum, located in Ancona (central Italy), has been created to fill this gap in the range of cultural services for blind people and also to offer an innovative space where artistic perception passes through multi-sensory, rather than just visual, stimuli.

The original location was an old school: the route was provided with special educational aids, information in Braille and black and a Walk Assistance technology. The signal was transmitted by a copper wire (the low tension conductor), located under a yellow sticky stripe along the route: this emits a very low sound, a vibration that can be felt by the handle of a special cane. An accessible museum for blinds must use auditory perception for orientation. The new site of the Museum is in one side of the pentagonal Mole Vanvitelliana, a strong cultural landmark for citizens.

The guidelines of the scientific project for the new Museum inside the Mole were drawn up by an international scientific committee, which was established in July 2009. This first document generated the preliminary project, which was designed by Arch. Alessandra Panzini and approved in March 2012. At present, some in-depth technical and scientific procedures necessary for the completion of the new exhibition areas are being drafted.

Innovative technological solutions will be widely used to increase interaction between the public and the collection. Installations and multimedia contributions will, on the one hand, provide a multidimensional interpretation of the work or the context that is being explored and on the other hand, will engage the different senses in order to create a more complex and effective narration. Audio and audio-visual equipment, and possibly olfactory stimulation, will be used in order to increase the sensory impact.

There will also be introductory models, information panels and captions in Braille and in black print, images, tactile maps, mobile platform ladders for tactile exploration.

An agreement with Università Politecnica delle Marche has led to the development of a research project aimed at studying and developing a tracking system capable of guiding blind visitors around the exhibition, independently and without any help from support staff.

So far, some examples of interventions done on single Heritage sites, or areas, have been presented. A wider and more complex project is represented by the city of Venice, which is a particularly interesting case study, since it is a true open-air museum: Venice is one of the most important tourist destinations in the world for its celebrated art and architecture. The city is visited by an average of 50,000 people each day. It is regarded as one of the world’s most beautiful cities. The city in its entirety is listed as a World Heritage Site, along with its lagoon. Composed by several little islands, built on pile-dwellings and connected by a dense network of bridges, the city does not offer the ideal conditions for an intervention to increase accessibility.

Nevertheless, with the catch-phrase “Venice City for All”, the municipality has bravely begun the realisation of the Plan for the Elimination of Architectural Barriers – PEBA (whose implementation is regulated by Italian legislation, Art. 32, law 41/86 and art.24, law 104/92).
The project of urban integrated accessibility has taken into consideration two main aspects: the accessibility of public transports and the accessibility of bridges connecting the different parts of the city. Accessibility has been improved through the realisation of facilitated “friendly steps” and provisional ramps (Figure 12).

**Figure 12:** Venice. Example of ramps with facilitated “friendly step”

The commitment of the municipality of Venice towards urban accessibility has also concerned the drafting of specific maps aimed at identifying the urban areas with the greatest tourism impact. This first work was crucial for the intervention on the accessibility of water public transport: it led to the identification of accessible urban insulae and the realisation of twelve accessible itineraries starting from the steamboats docks.

Venice has also been able to integrate the project with the adoption of creative solutions, not necessarily related with the architectural context, but connected to the communication of accessibility: an example is the experience started in 2005 called *A Venezia le barriere si superano di corsa* – A run to overcome barriers: during the *Venice Marathon*, thirteen temporary ramps have been arranged. They have been available for all users for a period of five months: although they were originally provided for athletes, they represented the occasion to make Venice accessible with a consecutive three kilometers path. Thanks to the benefit they gave to all users, many citizens, not only people with disabilities, but also parents with children on prams, elderly people, people with various difficulties, expressed the need to keep the ramps forever.

This shows that the accessibility project in Venice was also based on the involvement of citizens and an understanding of their needs, a crucial element for the Design for All approach, as User-Centred Design.

Another interesting initiative undertaken during recent restoration works concerns the accessibility of some sites located in the historical centre for people with motor disabilities, obtained using lifts or temporary ground footways. In this way Venice can show its welcoming and inclusive spirit through an original communication based on the catch-phrase “*Aperto per lavori*” – “Open for works”.

Considering the high presence of bridges, connecting the majority of pedestrian paths, and the steamboats as the only means of transport towards Venice, the public administration focused on this latter crucial aspect for accessibility.

It created, where necessary, several access ramps, providing an easy rise and descent for passengers. Steamboats also provide safe spaces for passengers in wheelchairs or children in prams and comfortable seats for elderly people and pregnant women (Figures 13-14).

**Figures 13-14:** Venice. Accessible public transport. Source: Studio Steffan
CONCLUSION

A good and fully sustainable project, even in the social perspective, should allow accessibility of places for the highest possible number of people, and give users the idea that they are not passive consumers, but that they participate in the place and are able to perceive and enjoy its meanings, sensations and value.

Architects and designers should think about the interaction between users and spaces. They should also work in order to make Heritage sites, be them in urban contexts or within a broader territory, able to effectively provide meanings to their users.

The accessibility project does not stop inside a single building but embraces a broader vision, thus offering an integrated Heritage experience.

From urban planning, to the organisation of pedestrian spaces, to the architectural interventions, to the information system, to the choice of details: the architectural language should be consciously used and it should not be based on mere aesthetical choices.

The issue concerns the ability to handle, not only the tools for urban planning and the compositional elements of architecture, but also the most useful elements for a wider, deeper and clearer communication. All projects or interventions on existing artefacts, especially in case of works of art for the general public like historical-cultural Heritage sites, should develop with the aim of broadening the audience, in the perspective of a broader usability.

A sustainable project – involving product and architectural, urban or territorial issues – also needs to be affordable. And it is more affordable if its affordability is guaranteed from the very beginning of the project, instead of adapting it at the end of the process, or – much worse – once it has already been realised.

REFERENCES

Centre for Universal Design., 1997. The principles for universal design, NCSU, North Carolina State University, USA.

Consulta per le Persone in Difficoltà – CPD., 2010. Manifesto della Cultura accessibile a tutti. Turin, Italy.

Council of Europe., 2006. European Landscape Convention, Florence, Italy.


González, S., 2013. Designing for the extremes, or why your average user doesn’t exist. sugoru.wordpress.com.


Ministero per i Beni e le Attività Culturali - Direzione generale per il paesaggio, le belle arti, l’architettura e l’arte contemporanee., 2009. Linee guida per il superamento delle barriere architettoniche nei luoghi di interesse culturale, Gangemi, Rome, Italy.


DESIGN OF A WHOLESALE KITCHEN MARKET IN DHAKA CITY

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Abstract

Food supply is one of the most vital functions for a city where this purpose is generally done by a large marketing system and this is called a Wholesale Kitchen Market. Mostly a city is not capable to produce all its required food supply for her dwellers; as a result, she needs to collect most of her food from different part of the country as well as from abroad. It is a very important function for any city because of its large scale contribution for ensuring a very primary and basic human need. The concept of Wholesale Kitchen Market is an essential component of any agricultural marketing system, especially for a horticultural crop producing country like Bangladesh. This Market generally deals with some very primary agricultural products like cereals, vegetables, roots and tuber, fruits, fish and meats etc; which come in and go out with different kinds of vehicles and where a large number of people of various professions are involved with these activities.

In Dhaka city, wholesale kitchen markets are growing unplanned, unhygienic and without having any particular system. The overall scenario of these market places is highly crucial and hostile. Inappropriate site selection, unplanned zone development and shortage of functional spaces are making wrong use of valuable land resource. Large number of incoming and outgoing traffic for loading/unloading systems also create severe traffic congestion in the middle of the city. There is always a lack integrity is observed in different types of working group who works in the wholesale kitchen markets. The raw products of the market, especially the perishable items create garbage, odor and an unhygienic environment. Even with the lack of a proper trading system, it takes some lengthy and unnecessary steps for products to reach the consumer.

Considering the great demand of functional development of Wholesale Kitchen Markets, this paper will try to identify the problems of the existing experiences as well as the opportunities for designing an efficient market system in six major aspects; these are space requirements for the kitchen market, internal zoning, internal transport system and loading unloading, unit or shop detail, human resource management and waste management. The focus of this research paper is to propose a sustainable design decision method for the future development of a Wholesale Kitchen Market in Dhaka city. This paper is based on field survey data, observational study and analysis of current five wholesale markets in Dhaka city and a B.Arch. Thesis, “Design approach of wholesale Kacha Bazar (Kitchen Market) in Dhaka city”.

Keywords: space requirements, kitchen market, zoning, internal transport system, human resource management, waste management.

INTRODUCTION

A wholesale kitchen market is a very vital function for a city like Dhaka as it serves the city dwellers with the essential basic needs of everyday life and that is food. In Dhaka city, wholesale kitchen markets are growing unplanned and do not have any particular planning guideline or operational systems. So it is essential to incorporate appropriate planning guidelines for designing or establishing a wholesale kitchen market.

A wholesale kitchen market deals with some organic products which come in and go out with different vehicles and where a large number of different people are involved with these activities. The wholesale kitchen markets of Dhaka City engage with some problems and these are:

- Unplanned and unhygienic development of the market creates an unhealthy and chaotic situation.
- Location within the city and space needed to serve the city population are never considered.
- A large number of traffic for loading/unloading creates traffic congestion.
- A product has to cross a long distance and unnecessary steps to reach the consumer.
There is no integrity in different types of working group.
A large number of generated waste creates an unhealthy environment.

This paper is going to discuss the problems and opportunities in six major aspects, space requirements for the kitchen market, internal zoning, internal transport system and loading/unloading, unit or shop detail, human resource management and waste management, based on field survey data, observational study and analysis.

Background
The wholesale kitchen markets of Dhaka city have been growing scattered and unplanned. Karwan Bazar is one of the largest kitchen markets in Dhaka, situated almost in the center of the city and always creating severe traffic congestion and chaos in the city centre which is a major commercial hub. Another large wholesale kitchen market is Jatrabari Bazar, located on the south east side of the city. In the south west part, beside the river Buriganga, there are three more markets and these are Sham Bazar, Babu Bazaar and Shuarighat, which specifically deals with vegetable, fruit and fish respectively. These markets are growing without any particular planning guidelines, policy or operational systems, which results in a completely unintended, unorganized and unhygienic market system. Again, Dhaka City Corporation (DCC) decided to shift the largest wholesale kitchen market from the city center Karwan Bazar to the four different edges (Figure 1) of the city. These are Aminbazar (in the north-west periphery of the city), Mohakhali (northern center of the city), Jatrabari (in existing part and southern periphery) and Lalbagh (in the western part beside the river). These wholesale kitchen markets need proper policy guidelines to develop and maintain a healthy sustainable environment and to ensure a proper operational system. This study will help to identify the problems and opportunities to retrofit the existing markets in some points and develop the new ones with proper guidelines according to the World Food and Agriculture Organization (FAO) and the observational study with field survey.

Objective of study
The objectives of this study are:

- To identify the problems and to propose guidelines from different primary standards for designing wholesale kitchen markets, addressing six major aspects; these are space requirements for the kitchen market, internal zoning, internal transport system and loading/unloading, unit or shop detail, human resource management and waste management.
- To determine the efficient operational system and design guidelines for designing Wholesale Kitchen Markets in Dhaka city.
Limitations
The research work is limited by a number of constraints like time, resources and some practical problems that appeared during the field survey. Limitation of the research period, limitation of manpower for survey and collection of data, limitation of resources from private and public sectors and limitation of proper data collection due to midnight operations and chaotic management systems can be considered as major constraints. There are few published or unpublished materials available related to this study. There are no concrete policies and proposals for developing or designing a wholesale kitchen market except a wholesale planning manual published by FAO. The study is therefore developed based on field investigation.

Methodology
Wholesale kitchen markets deal with different products. After the field survey and typology assessment, five types of products are considered for the study. They are cereals, roots and tuber, vegetable (leafy vegetable and fruit vegetable), fruit and fish. The methodology can be stated in four steps.

- **Field survey**
- **Literature review**
- **Data processing**
- **Observational study and analysis.**

**Field survey:** A field survey has been done in four steps with a detailed photographic survey, observational study and interviews.

- A photographic survey with observational study has been done to determine the existing system, and traffic movement of the existing situation.
- An observational study with field survey has done to determine the approximate area/ space which is occupied by the wholesale markets in Dhaka city currently. Again a detailed observational investigation has been done to find out the spaces or area occupied by different types of products, for example, vegetable, fruits, fish etc.
- An observational survey, questionnaire survey and photographic documentation of existing individual units / shops (almost 100 numbers) of some of the existing wholesale markets have been done randomly. For studying vegetable, fruit, roots and tuber; ‘Karwan Bazar’, ‘Sham Bazar’, ‘Jatrabari Bazar’ and ‘Babu Bazar’ have been investigated, for fish; ‘Suareeghat’ and ‘Jatrabari Bazar’ have been investigated, for cereal; ‘Mohammadpur Krishi Market’ and ‘Jatrabari Bazar’ have been investigated.
- A field investigation has been done to find out the flow of goods, from producer to consumer. So some retail kitchen markets and village assembly markets have been surveyed. For studying retail market, ‘New Market’, ‘Hatirpul Kitchen Market’, ‘Uttara Kushol Centre’ and ‘Karwan Bazar’ have been surveyed and for village assembly market; Nimshar Bazar (located at Comilla) has been surveyed.

**Literature review:** A literature study has been done from the regulatory standards of the world food and agriculture organization. Different reports, papers, thesis and books are also studied for the literature review. Some of the foreign wholesale kitchen markets are studied as case studies.

**Data processing:** The data found from the survey has been plotted on paper or charts for comparative analysis.

**Observational study and analysis:** After data processing, field survey and literature review have been comparative analyzed, an observational study has been done to determine the design outcomes from data sheet, charts, photographs and comparative analysis.

**DEFINITION OF A WHOLESALE KITCHEN MARKET**

‘Wholesale’ means the business of selling goods to retailers in larger quantities than they are sold to final consumers but in smaller quantities than they are purchased from manufacturers (Reverso Dictionary 2000). Wholesaling facilitates the economic function of buying and selling by allowing the forces of supply and demand to converge to establish a single price for a commodity (White 1991). A wholesale kitchen market is a transitional function between producer and consumer which deals with bulk amount of products coming from village assembly market and stores them or sells them to retailers or to city local markets.
CHARACTERISTICS OF EXISTING WHOLESALE KACHA BAZAR

The existing wholesale kitchen market of Dhaka city consists of unplanned organization system and zoning, an unhygienic and unhealthy environment and chaotic traffic movement. Products need to travel a long system and distance to reach the consumer in the existing system of a wholesale kitchen market. Again, there is huge volume of organic waste generated from perishable products which causes garbage, intolerable odors and an unbearable unhygienic environment in the market place.

Figure 02: Unhygienic corridors of Karwan Bazar wholesale kitchen market.

Figure 03: Chaotic situation of Sham Bazar wholesale kitchen market.

Figure 04: Unhygienic wet corridors of Jatrabari wholesale fish market.

Figure 05: Water transportation and loading unloading system in Sham Bazar wholesale kitchen market.

From the photographic survey, questionnaire survey and observational study of existing wholesale markets, existing problems and characteristics can be easily determined. Here, the existing characteristics have been studied in six identical aspects and these are space requirements for the kitchen market, internal zoning, internal transport movement and loading/unloading, unit or shop detail, human resource and waste management.

Site estimation and space requirement is a very important issue for designing and establishing a wholesale kitchen market. But, existing wholesale markets are not built with proper calculations or specific estimation, rather the regulatory authority allocates the location and size of the site from their assumption for this particular function. As a result, insufficient space for wholesale facilities creates a chaotic situation and congestion. Currently, there is no appropriate zoning system in the wholesale kitchen markets of Dhaka city (Tuli and Islam 2014). Lack of planning and proper zoning creates problems in the trading system of the existing wholesale kitchen market. Chaotic traffic movement, different types of motorized and non-motorized vehicle movement in the same road, poor and inadequate parking facilities and unorganized space for loading/unloading facilities make intolerable traffic congestion and a hazardous situation in the
market place. The shops or the units are not well organized as per trading activities. There is even no proper storage space, display and stack areas. Insufficient corridors between the units are always creating problems. Even natural lighting and ventilation is not considered in the market area. The stakeholders related to this function like 'Bapary' (local term for the trader who buys goods from producers in village assembly market and takes those goods to city wholesale markets by suitable transport), 'Arotdar' (local term for the trader who stores goods in the wholesale market), labour, waste collector, truck driver, retail seller, retail buyer, office staff, consumer etc can be considered as human resource (Tuli and Islam 2014). There are very few facilities provided for this group in these market places. According to the field observation and questionnaire survey to DCC waste collectors, Karwan Bazar generates 300-400 tons of waste each day (Tuli and Islam 2014). As a result, it is very difficult to remove it in a short space of time and this creates an unhygienic, unhealthy and degraded environment in wholesale markets.

PROPOSALS, GUIDELINES AND DESIGN OUTCOME

Site selection or the location of the site
As per Food and Agriculture Organization (FAO), a new site for a wholesale market will need to be reviewed at two levels: its general location within the urban area and its siting within its immediate neighborhood (White 1991).

Ideally, the wholesale market should be adjacent to a main road (White 1991). The ideal site is one visible from the main highway but which has its own segregated point of access not mixed up with local traffic (White 1991). The location of the market within the urban area should be considered by the requirements of the producer and the retailer’s transportation facilities. A common criterion is adopted, a maximum travel time of around 30 minutes for retailers to reach the wholesale market (White 1991).

Choosing the right site must consider three issues and these are:
  - Transport of produce to market
  - Physical context
  - Facilities.

Site estimation and space requirement
According to Food and Agriculture Organization (FAO), there are two approaches to estimate consumption: a demand approach or a supply approach.

**Demand approach:** The concept is represented by a formula, relating population to income (White 1991):

\[ Q_n = Q_0 \left(1 + \frac{p}{1 + ey}\right)^n \]  

where: \(Q_n\) projected consumption at year n, \(Q_0\) consumption in the base year, \(p\) annual rate of population growth, \(y\) projected growth of per capita disposable income, \(e\) projected income elasticity, \(n\) number of years from base date. This approach is very difficult to solve because of the shortage of data.

**Supply approach:** These are derived from estimates of present supply, making adjustments for imports, exports and food processing (White 1991). According to Food and Agriculture Organization (FAO), Annual consumption of foods in the year = catchment area or total population x kgs. per caput (maximum) availability (from supply method)

\[ 10 \text{–} 25 \text{metric ton} \]

Annual turnover tons/m²

An optimum overall annual turnover per square metre of sales area, which should usually range from 10 - 25 metric tons, including an allowance for main circulation areas (display/buyers’ walk and loading platforms) (White 1991).

**Space requirement:** Any of the following can be taken for calculating the space requirement,
  - Site estimation “4 - 5 tons of turnover per m² of overall site area” (FAO, White 1991).
  - Site estimation from populations that the site can serve.

From the field survey data, the space requirements can be calculated by the supply approach. In supply approach, the availability of major food items are:
Table 1: Changes in the availability (gms/person/day) of major food items, 1970-2001 (Source: Food and Agriculture Organization (FAO 2004)).

<table>
<thead>
<tr>
<th>Food item</th>
<th>1970-72</th>
<th>1980-82</th>
<th>1990-92</th>
<th>1999-01*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>411</td>
<td>387</td>
<td>431</td>
<td>452</td>
</tr>
<tr>
<td>Other cereals</td>
<td>45</td>
<td>68</td>
<td>59</td>
<td>68</td>
</tr>
<tr>
<td>Roots</td>
<td>56</td>
<td>46</td>
<td>35</td>
<td>59</td>
</tr>
<tr>
<td>Sugar</td>
<td>43</td>
<td>33</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Pulses</td>
<td>14</td>
<td>17</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Oils/fats</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Vegetables</td>
<td>43</td>
<td>31</td>
<td>32</td>
<td>35</td>
</tr>
<tr>
<td>Fruits</td>
<td>50</td>
<td>38</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Meat and eggs</td>
<td>12</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Milk</td>
<td>31</td>
<td>32</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>Fish</td>
<td>30</td>
<td>20</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>741</td>
<td>687</td>
<td>707</td>
<td>789</td>
</tr>
</tbody>
</table>

From the table per caput availability is found and it can apply in the equation 02. From field survey, the yearly turnover of wholesale kitchen markets in Dhaka city was found to be 20-30 tons/m² except for cereal. Here, turnover of 25 tons/m² can be assumed for roots and tuber, vegetable, fruit and fish, turnover of 100 tons/m² can be assumed for cereals (approximate data from field survey).

Catchment area population can be calculated by
- Ease of communication
- A radius of 30 min distance from retails (FAO)
- The number of people it has to serve.

Here among the four sites as example, Amin Bazar (Figure 1) site meets the site selection criteria as it is in the northwest part of the city and connects with the entry road to Dhaka city from the northwest part of the country. Here the catchment areas can be Pallabi, Dhanmondi, Mohammadpur, Mirpur and Adabar; where the population is almost 2 million. Here, future projections for population should be considered for feasibility.

Future projection: Future projection should be considered for design of a wholesale kitchen market. From previous growth rate and migration trends, future projections of population can be calculated. Population growth rate of Bangladesh: 1.26% (SPB 2008) and Migration in Dhaka per day almost ±2100 person. So it is found that,

- 05 year population projection for the Amin Bazar site: 3 million
- 10 year population projection for the Amin Bazar site: 4 million
- 20 year population projection for the Amin Bazar site: 6 million

<table>
<thead>
<tr>
<th>Items</th>
<th>Space Required (sqm)</th>
<th>5 years (Population 3 million) (sqm)</th>
<th>10 years (Population 4 million) (sqm)</th>
<th>20 years (Population 6 million) (sqm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Annual consumption /Annual turnover)</td>
<td>Population 3 million</td>
<td>Population 4 million</td>
<td>Population 6 million</td>
</tr>
<tr>
<td>Cereal</td>
<td>328000</td>
<td>3280.0</td>
<td>4920</td>
<td>6560</td>
</tr>
<tr>
<td>Roots and Tuber</td>
<td>42000</td>
<td>1680.0</td>
<td>2520</td>
<td>3360</td>
</tr>
<tr>
<td>Vegetable</td>
<td>35040</td>
<td>1401.6</td>
<td>2100</td>
<td>2800</td>
</tr>
<tr>
<td>Fruit</td>
<td>21160</td>
<td>846.4</td>
<td>1260</td>
<td>2080</td>
</tr>
<tr>
<td>Fish</td>
<td>32120</td>
<td>1284.8</td>
<td>1920</td>
<td>2560</td>
</tr>
</tbody>
</table>

Table 2: Estimation of space requirement (applying equation 02).

Again, According to Food and Agriculture Organization (FAO), a rough rule-of-thumb for the portion of the site covered by buildings should be around 20 - 30 percent, road space and parking between 50 - 60 percent and other uses, including drain reserves 10 - 20 percent of the total area (White 1991). From the existing market survey, it is found that 25-48 percent for buildings, 40-50 percent for road space and parking. So for site estimation, it can be assumed that, Road and parking 50%, Build space 30%, others 20%. From Table 2, the build space has been calculated, from where it is easy to estimate the required site area.

Internal zoning
Zoning can be considered by the type of selling products of the wholesale kitchen market (Tuli and Islam 2014). Zoning should be done by the types of products, types of service needed, types of space needed, circulation etc. Primarily the zoning can be done by perishable and non-perishable items. The items needing water should be located in the wet zone. Wet zone, dry zone and semi wet zones should be designed separately for ease of services and maintenance. As cereal and roots and tuber are non-perishable items, so these can be located in the dry zone. Fruit, vegetable and fish are perishable items, and should be grouped together for ease of water supply and drainage. Vegetables and fruit should be located in the semi wet zone whereas fish should be located with a distance from other segments due to its odor and ease of service.

![Figure 6: Estimation of space requirement and internal zoning.](image)

**Internal transport system and loading unloading**

Every day, a large number of different vehicles approach the wholesale market. Both heavy and light vehicles like trucks, pickups, covered vans (heavy vehicle) and auto rickshaw, rickshaw van, rickshaw (a local non-motorized vehicle) etc (light vehicle) approach here and create an inconvenient and conflict situation. Inadequate parking facilities allow road side parking and road side loading/unloading activity which creates severe traffic congestion. Internal transport system and loading unloading can be discussed in three subtitles; these are parking facilities, transportation and loading/unloading system.

According to Food and Agriculture Organization (FAO), wholesale kitchen markets should adopt a one way circulation system, a central zoning of markets and a ring road where minor loop roads penetrate within the blocks. It is always better to avoid crossroads. For parking requirements, minimum 2-3 spaces per 100sqm of sales area and 4-6 spaces per 100sqm of sales area (for peak hours) proposed by Food and Agriculture Organization (FAO). There should be an arrangement of remote reserved parking area. Loading & unloading should be adjacent to the market.
Table 3: Comparison between the internal transport movement and loading/unloading system of existing wholesale markets, Food and Agriculture Organization (FAO) and proposal for design. Here the red arrows are incoming traffic which serves the unloading bay and green arrows are outgoing traffic which serves loading bay.

The proposed system is stated below. A one way traffic system with no crossroad and dedicated loading/unloading bay has been proposed here.

**Unit or shop detail**
For unit detail, it is essential to estimate the planning grid. The planning grid might be the most favorable size of sales areas and wholesalers’ stalls because if they are over-sized this is likely to lead to a low turnover.
(less than 15 tons m²) and an underuse of resources (White 1991). Otherwise the rents will be high which should not exceed 2 - 3 percent of the value of sales (White 1991). In the wholesale markets of Dhaka city, the planning grids are based on structural members or equal dividing of the total span of the structure. The ideal method is to use the minimum of fixed walls so that premises can be defined by moveable partitions, usually constructed of steel mesh (White 1991). It is found from the field survey that there are very few partition walls in the units of the wholesale kitchen market of Dhaka city.

From surveying more than 100 units with location, size, grid pattern, corridor width, display type, storage type etc; an ideal unit design is proposed here for design.

![Figure 9: Proposed unit with removal partition wall and accommodation space in the upper floor. (A) One grid divided into two units with removable perforated partitions. (B) One grid divided into four units. (C) & (D) Accommodation space in the upper floor.](image)

The units for vegetable, fruit, cereal, roots and tuber and fish are stated below.

**Vegetables:** Trading (buy and sell) of bulk amount of products in this unit do not require a large long term storage space. Minimum size of corridor found 2m. This type of unit needs proper lighting and natural ventilation. (Figure 10)

**Fruit:** Fruits need some long term storage facilities and large display facilities. This type of unit needs proper lighting and natural ventilation (Figure 11).

![Figure 10: Proposed unit for vegetable (Plan and Section) Green parts are short term storage and grey parts are counter.](image)

![Figure 11: Proposed unit for fruit (Plan and Section) Yellow parts are short term storage and grey parts are counter.](image)

**Cereal:** This type of unit is larger than other types due to its long term storage facility and needs a wider corridor for movement. This type of unit needs large store facilities (Figure 12).

**Roots and Tuber:** This type of unit need short term large storage facility, and a wider corridor for movement (Figure 13).
Fish: Fish market trades (buy and sell) a bulk amount in a very short time. The fish market uses ice and water which needs to drain out from the unit. The fish market needs a refrigeration system for short term storage. This type of unit needs proper lighting and natural ventilation (Figure 14).

Human resource management
Different stakeholders related to this function need different facilities like accommodation, catering facilities, recreational facilities, toilet and bathing facilities etc. From the field observation it is found that, people used to live in a drop slab (mezzanine floor) in the shop and labourers slept on the floor or on their Tukri (bamboo basket in which the labourer carries goods on head). There are a few places for catering facilities, toilet and bathing facilities in the wholesale markets of Dhaka city. The shop owners or sellers use to live in the shop due to 24 hours operation and security reason. Figures 15 and 16 are the proposed facilities for accommodation, catering, recreation, toilet and bathing for the working people in a market place. It is again important to ensure proper lighting and ventilation in accommodation areas. All facilities can be designed in separate mass or can be split in different spaces as per the convenience of master plan.
Waste management
Waste management is one of the vital issues for wholesale kitchen markets. Dhaka city produces large volumes of food waste and almost 67% of the total city waste (Enayetullah 2008) and each day almost 300-400 tons of waste is generated from Karwan Bazar wholesale kitchen market (Field survey). All parts of the wholesale market do not produce the same amount of waste. So if the waste can be removed from its source of generation, it will be easy to manage. For this reason, the highest waste generated zone should be identified. There should be a rapid system to remove waste which is currently unavailable in our market.

Waste should not be treated as waste. It is better to reuse or recycle it. It can be used as energy producing raw material. Here 3 design proposals are stated.

A. Proposal 1: Waste collection system should be maintained 24 hours in wholesale kitchen market and there should be authorized workers for waste collection.

B. Proposal 2: As the unloading bay generates maximum waste and unloading parking generates 2nd highest waste, so the waste collection point can be placed between the unloading bay and unloading parking.

C. Proposal 3: Waste should be treated as a resource and not as waste. It can be used as energy producing raw material. Here 3 design proposals are stated.

   A. Proposal 1: Waste collection system should be maintained 24 hours in wholesale kitchen market and there should be authorized workers for waste collection.

   B. Proposal 2: As the unloading bay generates maximum waste and unloading parking generates 2nd highest waste, so the waste collection point can be placed between the unloading bay and unloading parking.

   C. Proposal 3: Waste should be treated as a resource and not as waste. It can be used as energy producing raw material.
Proposal 3: As the unloading bay generates maximum waste, so this unloading bay can be designed as a waste collection point.

Figure 22: Waste collection point: in the unloading bay.

Pollution
Pollution is another important issue which always has been overlooked by the designers or decision makers. The exhaust smoke and the dust from vehicles can affect the hygiene of food. A green barrier or buffer can easily solve this problem.

Figure 23: Exhaust smoke from trucks affects the market area.
Figure 24: A green barrier is created to stop exhaust smoke from truck to enter the market area.
CONCLUSION

Wholesale markets are a vital component of any agricultural marketing system, especially for horticultural crops (Seidler 2001). The purpose of designing a wholesale kitchen market is basically the idea of an efficient market maintaining system with health and hygiene for ensuring the proper product supply system. Designing a kitchen market with proper policies and guidelines can ensure appropriate use of space, ease of transportation, hygiene of food, precise economic value of food which can benefit both the producer and consumer. A sustainable design may also help to avoid unwanted steps and lengthy procedure of flow of products from producer to consumer.

ACKNOWLEDGEMENTS

We are eternally grateful to Prof. Dr. Shahidul Ameen, Prof. Dr. Khandaker Shabbir Ahmed, Dr. Mohammed Zakhiul Islam, Md. Ruhul Amin, Patrick D’ Rozario and Md. Mohotaz Hossain for their cordial support and cooperation. We also would like to thank Eng. Abdus Salam, Project Director, DCC, who helped to form the project proposal. Thanks are due to junior students of Architecture Department, BUET; Jisan, Shamim, Uzzal, Fahim, Samiha and Trisha; for their sincere effort and time during the field work.

REFERENCES


BUILDING INTEGRATED COCONUT ENVELOPE SYSTEMS – RETHINKING THE ROLE OF ‘LOW-TECH’ MATERIALS FOR HIGH PERFORMANCE IN THE HOT-HUMID REGION

Mae-ling Jovenes Lokko, Prof. Anna Dyson, Prof. Jason Vollen, Rensselaer Polytechnic Institute, Center for Architecture Science and Ecology (CASE), USA, lokkom@rpi.edu, dysona@gmail.com

Abstract

Across different cultural and climatic contexts, the decreasing role played by local systems and materials in the production, maintenance and upgrading of the urban built environment has led to the widespread adoption of standardized technologies alongside a concurrent homogenization of architectural identity. Studies have demonstrated the glaring economic and environmental costs of this shift, resulting in higher costs of construction, maintenance, rising energy loads and deteriorating levels of indoor human comfort. Recent developments in the field of material science and industrial biopolymer research have provided opportunities, through the use of renewable agricultural by-products, to alleviate the costly mechanical modulation of environmental flows through the use of high-performance materials.

This research proposes a design framework for the development of local knowledge economies that activate the potential for post-agricultural waste to propel local industrial development of low-carbon products and become global models for driving performance metrics of building life cycles. Through the collaboration of Ecofibers-Achitech Ltd (Ghana), a small-scale agro-industrial company, and the Center for Architecture, Science and Ecology (CASE) at Rensselaer Polytechnic Institute (USA), the development of coconut agricultural by-products is designed in response to social, economic, environmental and technical criteria using life-cycle methodologies, material testing, energy simulation and user evaluation feedback loops. The proposed design methodology integrates the use of culturally-situated design tools to reshape social perceptions of low-tech material systems, by situating the design development of coconut material systems in response to the environmental, social and semiotic historical functions of Ghanaian adinkra façade systems prevalent within the local context.

This design framework expands the extent socio-economic contexts play in the design and evaluation of building systems, as opposed to merely being impacted by such technology. The choice of coconut by-products is a reactionary, rather than prescriptive, design proposition to environmental and economic burdens within a hot-humid context. The architectural implications resulting from the effective thickening and aeration of the building facade proposes a conceptual and physical shift from two dimensional, materially inert and stationary surfaces, towards the construction of a responsive, dynamic boundary for inhabitation, storage and exchange.

Keywords: coconut agricultural by-products, academic-industrial alliance, built ecology, participatory design, culturally-situated design tools.
BUILT ECOLOGY PERSPECTIVE OF THE BUILDING BOUNDARY IN THE HOT-HUMID URBAN CONTEXT

Globally, the building sector accounts for 40% of current primary energy consumption (IEA 2013), contributes to one third of total greenhouse gas emissions (UNEP 2009) and represents a massive repository for embodied energy. The largest growth within the building sector, over 260% within the last three decades, has taken place and is projected to continue in developing and newly industrialized countries within the hot-humid urban region (Lime Agency 2007). In response to patterns of population increase and rapid urban growth, economic and social imperatives have often advocated for urban densification as a means of supporting larger populations more efficiently (Mindali 2004). However, the current role of high-embodied energy building systems in urban densification models, has demonstrated adverse impacts on access to natural resources and the quality of these resources. In dense hot-humid cities, the prevalence of such high-embodied energy materials and systems from imported markets have necessitated energy intensive resources to maintain comfort standards, leading to rising energy costs and larger ecological footprints (Chen 2001, Hui 2001, Newman 1999). If hot-humid urban contexts continue to adopt comfort standards, development models and material systems established in Western contexts, its global impact on energy consumption is projected to increase dramatically with near-term doubling of greenhouse gas emissions within the next two decades (UNEP 2009). The imperative is for emerging economies to shift from imported high-energy intensive material systems to low-carbon local and regional resource streams. In response to the described 21st century challenges, this research proposes a design framework for the development of local knowledge economies that activate the potential for post-agricultural waste to propel local industrial development of low-carbon products and become global models for driving performance metrics of building life cycles.

![Figure 1. Proposed shift within the hot-humid region from energy-intensive open material streams imported from developed contexts (left) towards a building ecology model stimulated by local and regional renewable agricultural-by-product resources (right).](image)

The subject of this paper, the production, use and maintenance of the building boundary in the hot-humid region, cannot be discussed without a reference to conceptual, economic and technological changes that have influenced its resultant relationship with natural resources and with human environments. The emergence of ecology in the mid-19th century, primarily concerned with the relationship of organisms to their environment (Haeckel 1866), has evolved to encompass a synthetic and integrated study of organisms and their role within a larger ecosystem. The impact of urban development pressures on the quality and boundaries of ‘natural’ environments has necessitated the study of the urban setting as a critical part of this ecosystem. The implications of this annexation was in one sense, physical, but more importantly, it reformed the idea of buildings as embodied and active energetic constructions, susceptible to exchange and
participation with other elements and organisms within the wider ecosystem. Whereas the ‘built environment’ view defined the relationship between humans and their human-built surroundings, a ‘built ecology perspective’ reframes to the view of the building as part of an ecological cycle, formed and maintained by both the flows of energy and material resources as well as the social and political mechanisms that have developed for the allocation of such resources.

Historically as seen in the earlier development of vernacular architecture of hot-humid climates, the construction and maintenance of the building boundary was largely sourced from resources within the local context, and maintained in accordance with climatic cycles and social processes. Human migration and interaction with local contexts began to produce new vernacular traditions that were increasingly based in material economies sourced further from sites of construction. The import of 20th century modern ideas of mechanization from the West, introduced a fundamental conceptual shift in the function of the building boundary as a mere material barrier, ‘independent’ of the technological conditioning of a habitable interior protected from a climatic and social exterior. Therefore, man could live comfortably and build independently of traditional energy and material constraints; primarily in response to opportunities provided by technology. For hot-humid contexts today, where such modern building technologies are increasingly commonplace, the implications of this framework descendent from this modern paradigm are not only economically and environmentally costly, but incapacitate such hot-humid economies to produce for themselves or develop valuable exchange capacities.

This research proposes a model of architectural education based on an integrated, cross-cultural and cooperative relationship between the academy and industry. The academic network is composed of key transdisciplinary collaborations between the schools of engineering, science, humanities and architecture, brought together within the field of Built Ecology at Rensselaer Polytechnic Institute, USA (Figure 2). The industrial partner is an agro-industrial company, Ecofibers-Achitech Ltd, in the developing context of Accra, Ghana that produces local coconut husk waste materials as sustainable alternatives primarily for agriculture. As described by the methodological framework (Figure 3), the research uses disciplinary-specific methodologies for data collection and analysis, but employs a mixed method feedback loop for collaborative design and evaluation of performance. This iterative and reflexive approach is significant to overcome the domination of any disciplinary methodology or criteria on other streams of research, whilst providing critical opportunities for adaptation and modification within the research process or conceptual framework (Klein 2008). By safeguarding best practice methods and standards for data collection and analysis within each discipline, the ecological framework leverages integration through a pluralistic understanding of performance.
LEVERAGING INTEGRATIVE METHODOLOGICAL FRAMEWORKS FOR REDEFINING PERFORMANCE WITHIN A BUILT ECOLOGY

The motivation for integrating different forms of knowledge within this research is to address the largely ignored role of qualitative metrics within and across different scales. A scale-based approach frames the design problem within the inherently multidisciplinary tradition of architectural development, where experimentation cannot be explored through isolation of any single scale. The interrelationship and rhythm of scaling, characterized by processes of reduction, scaling-up, redefining scope, disguising, iterative simulation and reevaluation occur, form a pragmatic methodology for projection and translation of performance values (Yaneva 2005). Within the scale of the material (<10^{-3}m), module (10^{-3}-10^0m) and system (>10^0m), the impact of qualitative metrics have significant implications for performance beyond insular quantitative assessments of system efficiency, technical coefficients of performance and cost reduction. An integrated model challenges the self-sufficiency of technocratic criteria for deployment, by engaging critical social, cultural and environmental criteria in driving and improving economic and technological performance.

Emergent metrics of qualitative performance are defined within three scales of design—material, module and system. At the material scale, employing a ‘social life cycle analysis’ of coconut material production within the agro-industrial context of Ecofibers-Achitech Ghana ensures that optimizations in technical or economic performance does not occur at the expense of deteriorating processing and use-phase conditions. Design at the scale of the module provides a critical opportunity to examine the role of ‘culturally-situated design tools’ in the empowerment of users to identify and sustain development mechanisms through the use of context-specific architectural technologies. In opposition to the modern, mechanistic paradigm that privileges ‘material anesthesia’ and pure geometries, contextual cultural iconography and patterns offer culturally valuable knowledge systems that concurrently maximize interfacial exchange, integration of facade elements for multiple functions and mediate natural resources in a diffused fashion. System scale
Experimentation evaluates data from digital energy simulations, against user-feedback and evaluation from full-scale digital and physical prototypes of the envelope system. Whereas optimization within digital simulation environments has primarily relied on climatic multivariable parameters around solar and airflow to reduce cooling loads, fieldwork expands criteria of performance to respond to the relevant user’s adaptive strategies as well as phenomenological and cognitive factors in determining indoor comfort.

**Figure 3.** Methodological diagram showing feedback loops within and between material, module and façade scales (Feedback loops between all three scales highlights the importance of interscalar design strategies, which are not bottom-up or top-down, but are considered in relation to other scales).
REACTIVE MATERIAL-SCALE PROPOSITION: LIFE CYCLE IMPACTS OF AGRICULTURAL BY-PRODUCTS FOR BUILDING APPLICATIONS

Reports by the United Nations estimate that the global population is projected to increase exponentially to 9 billion by the year 2050 (UN 2008); placing extreme pressures on agricultural markets to produce food and energy as well as resources for new construction. More critically, these processes of agricultural production are faced with concurrent environmental challenges of climate change caused by human activity, which are affecting agricultural production in both direct and indirect ways that impact crop growth and yield (Mestre-Sanchís et al. 2009). With growing awareness of the global limited resources and interconnections of the earth’s ecosystems, future agricultural production must be understood within a closed-loop paradigm, which evaluates and chooses processes of production based on their role and impacts on the larger ecological cycle.

In response to these challenges, agricultural production must either increase development within current areas of production or expand to new land areas of production (Rechcigl & MacKinnon 1997). While the latter expansionist proposition is limited both in the near and long-term due its inevitable contestation with space for human and ecosystem habitats, the former proposes increasing the efficiency of agricultural resource production for broader applications. Research in the field of industrial ecology has demonstrated the immense potential of increasing natural resource efficiency through the use of by-products. The principle behind the by-product synergy is to convert ‘wastes’, from primary agricultural processes into useful resources for secondary applications (Bailey 2003). Recent studies have shown that renewable global agricultural-by product resources can meet rising demands for fiber resources for building applications (Youngquist et al. 1996).

Within post-agricultural material markets, coconut husk waste is sustained by the renewable growth of 12 million hectares of coconuts throughout the coastal hot-humid region annually (Figure 4). Across the hot-humid region, 95% of coconut production is composed of small-scale isolated operations controlled by farmers who live on less than $2 daily (Greer 2008). The comparative advantage of coconut material streams over more abundant agricultural by-products is based on its high composition and advantageous extraction state of the valuable natural binder, lignin, within coconut husk waste. The ability of lignin within coconut waste to be processed at low-energy, non-toxic conditions to yield a range of high performance building products, makes this proposition a highly reactive technological and economic proposition to pertinent environmental problems within rapidly developing contexts. Coconut board products have demonstrated significant potential to substitute with timber-based materials and compete with commercial technologies to modify the quality of indoor air.

The introduction of coconut-by products to the construction industry for multiple uses affords significant impacts on the coconut value chain. In Ghana, contemporary coconut-by product consumer markets are divided into a large local food economy and a smaller global consumption market around high-end food and cosmetic products. The large-scale local economy is heavily based on the production of coconut oil, copra products and the informal sale coconut water from raw coconut husks. Waste husk material derived from informal sale of coconut water forms the single, yet most reliable resource for Ecofibers-Achitech Ltd., with daily supply rates of between 54-60 tons. Intermediary actors, such as coconut water sellers and farmers, are able to deliver waste husk products to sites of collection and receive monetary compensation where they typically spend time and resources solving daily husk-disposal problems.
In partnership with an agro-industrial company, Ecofibers-Achitech Ltd., the processing of coconut-by-products (binderless composite boards) is evaluated and optimized in relation to other alternative by-products such as plywood, low-high density timber and composite products, insulation and roofing products. As a startup company, Ecofibers-Achitech is positioned as outliers to a historically established agricultural industry. Although coconut by-products for agricultural applications (coir mats, peat blocks, and raw coir bales) are viable alternatives to alleviate long-standing nutrient retention, erosion and pest control problems, they are viewed as threats to well-established farming traditions supported by petroleum-based chemical fertilizers, additives and pesticides. Current consumers of coconut by-products are largely experimental agricultural and horticultural businesses that purchase such products for long-term water/nutrient retention applications, and as such do not ensure consistent demand.

The coconut-board by-product offers significant opportunities in process and product upgrading that impact the value chain and vulnerability of producers and subsequent users. Mechanical and chemical material testing of coconut boards developed in Ghana is enabled by the collaborative multidisciplinary setting within the university. Data from material testing are then used to inform the engineering of next fabrication cycle of coconut products at Ecofibers-Achitech Ltd. The subsequent processing upgrading of the husk-product, to reduce energy for production and the emission of harmful gases affords favorable working conditions for industrial employees. In weighing the significant advantage of coconut composite boards over open-air biomass combustion or the use of natural coconut pith over synthetic binders, such processing conditions and their adverse health effects on worker’s health offer comparative life-cycle values that ensure product optimization does not occur at the expense of deteriorating working conditions.

However, the technical and structural value of coconut by-product building materials described here lies in conflict with social and cultural values of ‘pro-development’ prevalent in developing contexts. Such value systems are rooted in 20th century political frameworks in developing contexts, which identify with the ‘modern’ image of architectural systems and materials found in Western socioeconomic contexts with inherently different environmental resources and burdens. The influence of such ‘modern’ values impact on
the integration of coconut by-products in critical ways – negative cultural associations with natural materials, perceptions of low durability and high maintenance, diminished sense of environmental control amidst changing thermal expectations and a perceived increase in micro-organism activity within the building environment. In order to overcome such negative social perceptions, user-interaction at both the module and system prototyping scale is employed as a double-edged tool for the purposes of evaluation as well as inducing new perceptions of material performance.

MODULE SCALE: TRANSLATION OF VALUE THROUGH THE USE OF CULTURALLY-SITUATED DESIGN

In the creation and reconstitution values of coconut by-product building materials, the design of the architectural system is proposed in relation to technical, environmental and social evolution of the Ghanaian adinkra façade system over the last four hundred years. Adinkra are visual symbols, used since the 17th century within West African culture, to transmit concepts and core cultural and cosmological knowledge. The persistence and spread of adinkra within the contemporary local and diasporan architectural landscapes, despite significant changes in material technology is evidence of the symbolic system’s ability to project and absorb meaning across time and cultural boundaries. If the social perception and evaluation of adinkra geometries are investigated in relation to formal technical and environmental propositions around increased surface area, multiple integrated function and diffused flows of natural resources within the facade, then social, technical and environmental criteria of performance can be developed in respect to each other.

Pre-17th – 18th century adinkra façade systems in the region were constructed from natural materials (earth and biopolymer fibers) that were susceptible to damage by rain and heat, requiring high maintenance over time (Figure 5). Such strength and durability problems were overcome in post-18th century façade systems, at the advent of stone and concrete material technologies. However, despite the ‘optimization’ of material technology from low tech, non-durable materials to weatherproof, high strength components, there was a loss in the collective work of façade components for multi-functional performance. For instance, pre-17th century adinkra façade systems, made from earth and bamboo components, the multi-scalar ‘positive-mass’ components of the adinkra pattern constituted the structure of the vertical facade members, transferring both vertical and horizontal loads from other parts of the building to the ground. The ‘negative-space perforations’ within each symbol adopted bioclimatic functions, allowing cross ventilation throughout the external and internal perimeters of the building. Structural and bioclimatic performance was constituted by an economic and environmental transaction between positive and negative members, which when grouped together communicated aesthetic, social and cultural meaning.

Figure 5. Persistence and adaptation of Adinkra architectural facades despite change in material technologies since the 17th century.

The shift mid-18th century to rammed earth structures, where adinkra patterns were mostly relief decorations, greatly diminished structural and bioclimatic function in service of its aesthetic parameters.
Although its use as a perforated brick in 19th-21st century facades was recovered, the level of structural and volumetric integration seen in pre-17th century adinkra systems was never recovered. Today this modern application of adinkra bricks has been to a large extent relegated to a form of nostalgic decoration and as a device that permits light and air across the building boundary. In determining the performance of coconut by-product façade systems, the particular demands of the urban hot humid climate (high latent loads, high dry-bulb temperatures, poor indoor air quality, minimal diurnal and seasonal swings) are likely to require multiple types of methods of operation that reflect more of a pre-17th century working mechanism of components and a larger volumetric distribution of material to aid effective interaction with external natural resources.

At the module scale, geometric characteristics of coconut media are designed in response to both technical and specific core qualities adinkra patterns commonly used within the test-bed site in Accra. The local production of adinkra facade systems offers critical opportunities to engage local architectural identities in rethinking the role of social criteria as it pertains to sustainability. Through design exercises of adinkra geometries, the variation of core elements of adinkra patterns (system of rotational symmetry, reflection, order of repetition, logarithmic curves, legibility) will be investigated in relation to formal elements that affect its structural, mechanical and sorption performance (scale, density, depth/thickness, perforation, surface area, organic content). Parametric form-finding experiments, producing iterations of components generated at the module scale, will be investigated in relation to (i) shading to minimize heat gain (ii) quantity and distribution implications of perforations for enhancing airflow and views (iii) inlet-outlet geometries. Data from parametric design of the module will be used up to inform initial façade-scale visualizations of coconut adinkra envelopes.
SYSTEM SCALE FEEDBACK LOOPS THROUGH PARTICIPATORY DESIGN AND DIGITAL ENERGY SIMULATION

Research at the system scale occurs within a digital simulation platform that serves as an iterative and synthetic context for testing the impact of culturally responsive forms on environmental performance and vice versa. The integrative digital framework also serves as a model for the physical test-bed construction in Ghana, in order to reintegrate the material and system performance hypothesis with relevant social and cultural criteria within an urban context in Accra. Such qualitative and quantitative feedback will be used to re-inform façade layout, operation parameters and control strategies within the test-bed. Two parallel methods of investigation will be used to evaluate the technical and social performance of the digital model.

Full-scale system visualizations generated from module design exercises will be exhibited in a public installation where feedback and design inputs from users based on their semiotic interaction will be collected (Figure 6). Semiotic interaction here primarily refers to how users determine the significance of objects based on a composite of former and present knowledge of the façade characteristics and physical experience of visualization (Peirce 1955). As part of this fieldwork methodology, user surveys and semi-structured interviews are used to explore the dynamic capacity of the visualizations to produce new perceptions and meanings (Barthes 1972).

Figure 6. User interaction and evaluation of adinkra coconut façades using projection-based visualizations.
The global design of the adinkra facade will be developed in response to both shading strategies that can aid in reduction of thermal gains and airflow strategies that maximize ventilation through the interior. Computer fluid dynamics (CFD) will be used to investigate the relationship between the (i) scale (ii) location (iii) quantitative distribution (iv) inlet-outlet ratios of perforations and interior airflow patterns. Energy simulations are used to investigate the implications of coconut material systems on the reduction of cooling loads and controlling airflow. The digital simulation framework provides the critical ability to assess the thermal performance of coconut over competitive material technologies; integrating data gained from material fabrication and testing, such as thermal conductivity, heat capacity and thickness. EnergyPlus software is used to evaluate the impact of material properties of the coconut system on the reduction of cooling loads within a space (Figure 7). A comparison of the thermal gains of a concrete façade with that of a coconut external façade system for a building show the seasonal and diurnal reduction of indoor temperatures through a reduction in conduction and radiation. Typical midday temperatures in Accra are about 1-2°C higher in the coconut board skinned concrete building. However, in the late evening and night, it is significantly hotter in a concrete building where unwanted heat gains are radiated into the building's interior during the nighttime when latent loads rise to a maximum.

![Figure 7](image)

**Figure 7.** Energy simulation showing the reduction of mean radiant temperature of interior space using coconut external envelope system as a thermal buffer within Accra's hot-humid climate.

**INTEGRATED PERFORMANCE CRITERIA FOR BUILDING MATERIALS WITHIN BUILT ECOLOGY FRAMEWORK**

Through an integrated understanding of performance criteria for agricultural by-products, the metrics for the development of 21st century building technologies is expanded beyond quantitative criteria concerned
with energy reduction and efficiency towards context-responsive technologies that interact with climatic resources at the building boundary and engage the social context through culturally situated design (Figure 8a). The integration of knowledge and value systems moves this research from a ‘multidisciplinary’ to a transdisciplinary framework. The emergent transdisciplinary context, through a break with established disciplinary theory, standards and models of representation (Dillon 2008), facilitates an inclusive and relational understanding of social, environmental mechanical and economic performance. Through this framework, the translation of values across performance realms is enabled to inform composite forms of performance. A critical example of this is reshaping the social performance of coconut by-product building materials by engaging its economic and environmental comparative advantages over competitive material technologies as well as engaging alternative local knowledge and value systems that have profound political, economic and social impacts on user acceptability and identity (Figure 8b).

**Figure 8a.** Integrated performance criteria for building technologies.
CONCLUSION

Given current energy consumption profiles, population and economic growth in developing contexts and their consequent demand on energy resources will form critical determinants of future qualities of life beyond regional boundaries. The urban hot-humid region, which represents the largest demand of future energy markets, necessitates the development of local renewable material resources for future building ecologies as an alternative to energy consumption patterns of developed context. The implications of the geographical alliance in this research constructs new forms of engagement with stakeholders in the developing context by providing a political and economic platform for emerging sustainable industries, where national funding mechanisms, policy gaps and institutional frameworks are largely absent. The reflexive, co-locational development of the technology engages entrepreneurial groups, culturally situated tools and users within the hot-humid region to stimulate local knowledge economies.

The interscalar design methodology confronts the social perception of traditional systems at the material scale as regressive socioeconomic systems through design feedback loops that engage module and system scale strategies to translate contending value systems. The material-based impact of this work addresses critical life-cycle metrics that can be used to propel local and regional industrial development of low-carbon products to drive sustainability metrics in material life cycles. The integrative framework for quantitative and qualitative performance brings the notion of architectural identity and its working mechanisms through culturally-situated and context-responsive design to the forefront of building technology development.

Within the architectural discipline, this research expands the role of architect within the development building systems by challenging current building research and development frameworks that view the architect as end-consumers of technological products, mainly facilitating the integration of these products into buildings. The proposed research framework affords architects the agency to evaluate technological products under broadened performance criteria in order to inform new avenues fundamental research and building integration. As an architectural technology, the integration of this low-cost lightweight coconut board as an external skin is highly desirable for environmental load reduction in low-middle income housing.
projects in the developing urban hot-humid region. The global architectural implications resulting from the effective thickening and aeration of the facade proposes a conceptual and physical shift from two dimensional, materially inert, stationary surfaces towards a responsive, dynamic boundary for inhabitation, storage and exchange.

REFERENCES


Greer, S., 2008. ‘Converting coconut husks into binderless particle board’, Master’s Thesis, Baylor University, Texas.


Yaneva, A., 2005. ‘Scaling up and down extraction trials in architectural design’, *Social Studies of Science*, 35, pp. 867-894.

ADAPTING THE NIGERIAN BUILT ENVIRONMENT TO CLIMATE CHANGE.

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Abstract

Recent flooding of two-thirds of the states in Nigeria is a pointer to the impacts of climate change. The country will need to cope with rising temperatures and increased precipitation (rainfall). Over a period of time, the unpredictable changes in weather patterns is expected to stress infrastructures, endanger flora and fauna of both rural and urban settings, render unfit and/or destroy habitations, increase illness and deaths among vulnerable populations. In spite of the mounting challenges and its associated risks, the Nigerian built environment and indeed Africa’s are yet to integrate climate adaptation into their developmental program. Today’s infrastructural investment within the country is not taking into consideration the effects of climate change nor are they targeted to meet the requirements of a long lifespan, this is further compounded by the inadequacies of the urban and rural management systems that in most cases are ill informed of the changing risks situations/scenarios. Within this discourse, of significance is the necessity to link current official adaptation plans to an enhanced and expanded natural risk assessment, management and mitigation program with a capacity to adequately respond to such anticipated challenges. This paper addresses some of the challenges confronting the vulnerable populations and adaptation of the built environment. The paper also discusses implementable strategies that will enhance adaptation activities within the Nigerian urban environment, by describing a probably potential climate change adaptation structure that is all encompassing.

Keywords: adaptation, built environment, climate change, community management.

INTRODUCTION

Recent studies classify Nigeria as one of the flood prone nations on the Gulf of Guinea (FME 2009). It is anticipated that the global climatic phenomenon would multiply the occurrence severity of present risks with devastating social, economic and spatial impacts (Onyenechere 2010, Revi 2008). A worrisome scenario is the inability of urban poor in various slums to cope. This category of people, account for almost half of the population in the built environment (Revi 2008). The central point of this paper is on adaptation led planning to cut down climate change threats and improve the built environment’s capacity in tune with the nation’s priorities and challenges. The paper will try to exchange the reactive centred responses by suggesting an adaptive flood management path for a more sustainable future. The adaptation process is viewed from two stand points namely a frightening population projection of about 800 million people by 2050 (FME 2009) and massive migration from rural to urban centres.

In the last decade of twentieth century, urban Nigeria began to outdo its rural counterpart in per capita income and GDP by as much as three times (Aworemi 2011). Its agricultural sector contributed less than 15 percent to the GDP (Iguisi 2011). Protecting the stability betwixt the rural and the urban environment becomes essential as the socioeconomic and natural resource variance of rural-urban and interurban places intensify (Adger 2003). Shuaeeb (2011) identified the oil boom of the 1970s; poor livelihood quality; critical moments in the creation of new urban formal-sector living and working conditions in an age of globalisation; and inferior rural educational development policies as factors that influenced resettlement in Nigeria. A new addition is climate change. Iguisi (2011) and NASPA-CCN (2011) submitted that the dwindling fortunes of the nation’s agriculture sector could be compounded by climate change causing further migrations. Currently, about sixty percent (60%) of Nigeria’s population live in urban centres (Shuaeeb 2011, Daramola et al. 2010). It is anticipated that over the next few decades, the urban population would rise to about 87% generating three mega cities namely Lagos/Ogun, Abuja/Nasarawa and Onitsha/Owerri/Abba (Abbass 1998, Aworemi 2011). This will significantly increase pluvial flooding and demands a pragmatic adaptation mechanism.
Climate change adaptation in Nigeria’s urban landscape is a policy concern on basis short term because of its close links with infrastructures, livelihood, power, security and ecosystem (Boko et al. 2007). Nigeria, like most emerging economies; China and India, is intensifying her efforts on a large scale provision of infrastructures in housing, energy, water, telecommunication, health care and transportation sectors, to favourably help her development. These facilities have an average lifespan or service life of 35 to 50 years. The bone of contention for Nigeria is to study if its current path of growth, expansion and development framework may be more suitable than a commitment to adaptation and eco-friendly structure and construction. A climate strategy that is compatible with Nigeria’s peculiar state, strengths and capacities may be beneficial to both her and the world’s goal better than an unoriginal policy or framework from a somewhat different setting.

**CURRENT CLIMATE CHANGE PALLIATIVE MEASURES, DISASTER MANAGEMENT AND URBAN REHABILITATION IN NIGERIA**

Despite scholarly works, early environmental crusades on these issues, Nigeria’s involvement with the issue of climate change is of a slow start (Opaluwa et al. 2012). Nigeria has been deeply absorbed with the demanding situations of poverty, political, social development and economic challenges (Ozor et al. 2010). Since 1999, the Nigerian government has initiated and implemented nationwide technical appraisals of the dangers of climate change, its impact, adaptive and mitigating alternative choices (FME 2003; 2009, NASPA-CCN 2011). These appraisals, being mostly externally driven and funded, were coordinated by the Federal Ministry of Environment - FME (FME 2003; 2009; NASPA-CCN 2011), which is far from being a political powerful ministry. This governmental arm is mainly focused on the science domain of climate change, closely related to the International Panel on Climate Change – IPCC – order of business and style of analysis (NEEDES 2010, Ogbo et al. 2013). This approach is wanting in its involvement with the complicated character and high level vulnerability in Nigeria, which is likely the most vital component in risk mitigation (Adebamowo et al. 2012). The nation’s stance on climate change is noticeably opined to an instilled obligation of rectifying historical emissions by the Annex I countries (Odeku et al. 2004, Salami 2012). Hence, it is centered largely on the greenhouse gas-energy nexus (Hasicic et al. 2012). As a result of Nigeria’s low scientific research culture and her passive status in IPCC, the discussions and strategies on adaptation is lacking effectiveness (Salami 2012).

The nation is currently losing a good chance to create and bridge an official climate change adaptation agenda with the natural risk assessment, management and mitigation capacity being developed after the flood which occurred in 2011 & 2012. A number of averagely productive post disaster reformation and mitigation programmes; subsequently after the major flooding of Bayelsa, Kogi, Lagos, Rivers, Niger states between August & October of 2012, has unusually changed the awareness, the organizational attention and effort at susceptibility decrease and hazard mitigation. Nigeria has a centralized command system to combat disaster in terms of management – NEMA. There is the need to review present guidelines for the built environment to provide the basic foundation for a more evidence-based set of climate mitigation and adaptation standards for the Nigerian urban built environment, which could act as drivers for regular growth (Ogbo 2013, Dimuna et al. 2010).

The government and its Ministries, Departments & Agencies (MDAs) are targeting sectors with direct impact on infrastructural development, urban governance and poverty. A big gap is noticeable in the authority’s campaign on the built environments development plan and vulnerability reduction for vulnerable persons in the urban area. The urgency to provide even-opportunity to land, housing and access to sufficient public services to most of city residents is still in controversy. Deepening the vulnerability of many urban residents is the rate of demolitions most times without relocation in major cities like Lagos and Abuja between 2003 till now. Ending this deadlock will cause a change from providing basic services, access to livelihood and housing, to guarantying their continuous supply, use and funding. Nevertheless NEMA or its related agencies are not dealing with urban vulnerability or risk mitigation, which demands active support and networking by the climate change community to sustaining the built environment & advancement (Adebamowo et al. 2012). If not, urban adaptation and mitigation could be confined to subscribing operationally empty proposals and agreed to documents between Nigeria and Annex I countries, with little influence on the most vulnerable (Opaluwa et al. 2012).
DOWNFALL AND TEMPERATURE CHANGES

The rise in changing environmental conditions as an important risk throughout this century remains a fact but, there is yet substantial instability regarding exact mechanisms and influences, particularly related to precipitation. Despite the uncertainty, there is a wide unanimity on the range of first-order climate change impacts in sub-Saharan Africa:

- An overall rise in both average minimum and maximum temperatures by 1-4°C, contingent on actual atmospheric greenhouse gas concentrations (FME 2003), with a strong effect on evapotranspiration levels and consequently human activities, agriculture, and forestry, particularly in dry and rocky regions.
- This could contribute to an average surface temperature increase of 2-4°C, which would entail variations in the operations of some communities and in the location and practice of building all over the nation, with an accelerated use of passive solar and energy efficient design (FME 2003).
- This zonal temperature increase, accompanied by changes in the international climatic system, may result to a mean increase of 5-15% in yearly water downfall, with resultant effects on agriculture/food security, housing and health.

![Figure 1: Surface Air Temperature Changes over time](Source: Salami 2010).

![Figure 2: Flooding of Lokoja, Kogi State in 2012](Source: Google Images).

EXTREME WATER DOWNFALL CASES; RIVER AND INLAND FLOODING

The next significant climate change risk is the rise in watercourse and midland deluge, especially in the south-south, north & south-west and north-central zones of Nigeria. Hundreds of thousands were affected by the September 8, 2012 flooding, thousands more are presently affected by the deluge caused by the six to nine months of increased rains in Nigeria (NASPA-CCN 2011). This is predominately due to the soaring people concentration across these zones, combined with very high vulnerability as a result of a combination of poorly planned and implemented flood management systems and high degree of impoverishment, which through recent years have extremely reduced the surviving ability of thousands of residents of Nigeria (NEMA 2011). Changes in climate are envisaged to escalate the severity of flooding in many Nigerian states and West African sub-region.

Lagos, Rivers, Kogi along with other states in the south-south and North-central, which are key to Nigeria’s economic life line, have encountered terrible flooding for three successive years since 2010, leading to huge economic losses, loss of lives and break down of infrastructural services (Adebamowo et al. 2012). The damaging floods of 2012 were caused by a combination of factors; dam release, extreme weather etc (Momodu et al. 2012, Emodi 2012).
ADAPTATION – WHAT WAS, WHAT IS AND WILL BE – IN NIGERIA

In view of the possible hazards in connection with climate change, a significant amount of work on differentiating and comprehending adaptation is therefore in progress. Earlier parallels of adaptation where accompanied with strategies and social science study on the existing acclimating ability of governments, civil groups and markets to manage climatic disturbances. The financial implications of imminent adaptations are evolving by considering the divergence between the fiscal shortfalls associated with possible situations of technology comprehension and dissemination. First, it is essential to characterise adaptation by who is responsible for it and the concern of all interested parties participating in it. It is obvious that every person and every civilisation have been adapting and will adapt to climate change throughout the time of man’s existence. Adaption by individuals in some cases is carried out in reaction to the climate risks faced (Hasic et al. 2012). More adaptations are carried out by the government for the general public in expectations of changes; then again, it is always in reaction to singular severe events. But this process of policy management is not isolated; they are entrenched in societal procedures that mirror the connection between individuals, their people system, abilities and communal resources, and the state (Adger 2007). At times, differences are derived between intended adaptation, expected to be undertaken by governments for the public and independent adaptation by persons.

Present researches, are fixated on recognising universal elements of recovery. These elements comprise the human and economic resources, the adaptability and creativity in government establishment and the private sector to comprehend chances related to climate change, and the basically hidden health conditions and comfort of person(s) confronted with the effects of climate change (Adger 2001). The solution is to choose the distinctive features of the institutional and technological situations that stimulate specific but justifiable adaptation. Combined approach is vital in accelerating adaptation gaining impetus from political, environmental interactions, and other academic perceptions. Studies on combined approach have shown (Agrawal 2001, Klein et al. 2007) that the magnitude of the people pledged to the collective action, the limits of the assets in danger, the ability of the people concerned being in one accord, the spreading of accrued value of management and more influences are wholly crucial in defining the eventual success of joint/combined supervision. Investigative study is requisite to how combined approach is pivotal to the extent of adaptation at different levels of decision-making. Currently, the understanding around reactions to climate change as a combined approach are basically used to appraise the degree of nationwide collaborative fight in decreasing greenhouse gas emissions within the UNFCCC instead of on the means and ways by which adaptation develops (Roberts 2008, Dimuna et al. 2010). Earlier climate variation conflicts with possible situations stemming from climatic environmental sample try-outs in pursuit of a clearer perception on adaptation.

Migration, for example, is a coping mechanism used throughout history by societies as part of their resource utilization strategies and as a coping with climate variability (Adger 2003). In Nigeria, urban migration remains a significant factor in livelihood resilience even as of today. If the anticipated migration is not accessible to those on the receiving end, it may eventually intensify the need of forced migration,
normally embarked on as a last resort when other possible survival tactics have been tried. Owing to international differences, migration may be a restricting option in many parts of the world; therefore other means of reinforcing adaptive capacity and improving resilience are necessary. These may be built on current coping strategies or may seek to initiate new ideas in relations to technology or organisational and/or societal advancement.

BUILDING AN ADAPTATION FRAMEWORK FOR THE URBAN BUILT ENVIRONMENT

Evolving a climate change adaptation framework for Nigeria’s built environment will involve initiating discussions on environmental development and growth, vulnerability, identifying individual risk factors, changing focus of on-going investments and programmes and the development of new relationships amid a wide variety of stakeholders. A reasonable way ahead is to develop the current drive of risk management and mitigation efforts. This is most efficiently done by conventionalising them into urban regeneration initiatives and mobilization from the grassroots through non-governmental organisations – NGOs, community-based organisations – CBOs and diplomatic means in particular cities. Having in mind that a number of these actors have little or no knowledge of climate change issues, the building of a structure connecting dialogue, engagement and action would be valuable move.

This structure would need to provide a connection between federal, state and local government/community-level policy, governmental institutional arrangements and interventions at city and community levels. It would likewise function as a stage for discussions between government representatives, political heads, NGOs and CBOs who are keen in trying to direct communal and individual momentum towards positive ends and individuals who could supply the motivation for executing adaptive measures. Possible urban climate change adaptation frameworks are put forward hereafter.

AT THE FEDERAL LEVEL

Nigeria has not developed a national programme on adaptation to tackle climate change risk reduction relatively due to institutional splits & divisions within the governance system of the nation and its economic state. The onus majorly lies with the Ministry of Environment, which has poor cooperation and working relationship with other key ministries. To incorporate a comprehensive sequential climate change plan into the total preparatory and investment procedure of Nigeria’s government would suggest a restructuring and strengthening of this role, with strong backing from the Ministry of Finance acting as the principal figure in outlining fiscal and monetary policies to induce both mitigation and adaptation, founded on a national programme for adaptation. This may require some amendments on certain sections of the constitution and the creation of a climate change secretariat to tackle inter-sectorial matters and harmonise policies and programmes.

The National Emergency Management Agency (NEMA) as a government parastatal, is the leading disaster management agency, with much of the task and actions centrally controlled and coordinate. SEMA (only one in each six geopolitical zone) has been reduced to Rescue Coordinating Centres – RCC or Disaster Reaction Units – DRU (NEMA 2013), which are poorly funded at this level and is non-existent at community level. The proposed climate change agenda could reconstruct current NEMA functions deficient of adaptation with medium and long term climate adaption. Government agencies and departments associated with urban development and poverty reduction should be the pivot of the built environment climate change risk palliation at the federal level and the principal outfit for climate strategy and guideline formation once suitable community and state capacities are put in place.

More so, the government of Nigeria may include the formation of a national crisis and susceptibility charts that comprises climate change, its associated risks and effects on economic activities. This will facilitate the detection of important communities and sectors for intervention and thus allowing access to windows of opportunities inside NEMA. More succession of public building and supporting infrastructure, crisis preventive standards will be required. A number of insurance covers for medium and short term risks to public services and systems and motivations (cash rewards and rebates) for public – private – community collaboration similar to the drive in the power and agricultural sector need to be set up. High level organisations that pool private and public sector components, pressure groups and the academia (environmental, sciences, technology & social sciences) will need to be put in place at the federal level to come up with detailed studies and solution driven networks in and relating to their areas of expertise.
Teaching, learning, training and capacity building at tertiary institutions particularly universities for public administrators, environmental managers and the media will require being kick started.

**Figure 5: Role of the Federal Government in CC Adaptation.**

**Figure 6: Role of the States Government in CC Adaptation.**

(Source: NASPA-CCN).

### AT THE STATE LEVEL

Disaster management at state levels needs to go beyond the six geopolitical zones to having one in each state. This may include beefing up and enlarging the capacity of all RCC/DRU. This can be structured along existing flood, land pollution, desert encroachment, and land erosion hazards reduction endeavours. Substantial levels of capacity building will be needed to organise and make ready these agencies to assume these added duties and come up with implementable adaptation programmes. The boards of the ministries of environment and finance will have to incorporate climate change adaptation into their regular forecasting and recurring costs framework and allow cooperation among overlapping sectorial mitigation and adaptation investments. Alterations are essential in the appropriate housing, urban development and town planning in its three dimensions – policy planning, physical planning and urban management – public services and systems legal coding, to incorporate disaster and climate adaptation matters into architecture, planning and development. Training and capacity building of officials and administrators on climate change assessment and adaptation is a vital investment in human resource development. The necessary actions for incentivising private endeavours regarding climate change mitigation and adaptation is best directed by government in some states e.g. Lagos, whereas in some others a private sector driven initiative is most ideal.

### AT THE COMMUNITY LEVEL

Every community must establish a system of climate change associated community based disaster management and mitigating ideas and plans, particularly for informal settlements and shanty towns in dangerous and susceptible locations. This would make available a starting point for a state-wide discourse on applicable mitigation and adaptation strategies comprising all stakeholders. This is important to building doable city adaptation schemes.

Present laws, regulatory and governing frameworks and the established culture of most cities in Nigeria are insufficient or none existent to tackle the challenge of climate change adaptation and mitigation. A city/community governance, planning and services distributing structures along with institutional arrangements will be needed to tie urban renewal and development with interim and regular risk reduction and eventually to climate change adaptation. The foundation to this is the building of people rights and service distribution to the underprivileged and most susceptible to make sure that present irregularities and systemic vulnerabilities are confronted. This may include further strengthening and interventions in real estate and housing provision, people amenity delivery, policies and an organised atmosphere at the state
level. It is most likely to be successful when put into action through the establishment and continuous reassessment of community development programmes. The right urban policy to facilitate multiple interested parties’ participation with pre-planned risk sharing and adaptation will assist in generating the right monetarily profitable inducements for adaptation associated with community driven activities, particularly in slums.

![Figure 7: Role of the Local Government/Community in CC Adaptation.](Source: NASPA-CCN)

![Figure 8: Role of the Civil Society Organisations in CC Adaptation.](Source: NASPA-CCN)

Inside the limits of this enlarged structure, a community – and state – scale hazard management scheme requires combining climate change and disaster prevention concerns amidst the existing land use and zoning instruments, into urban system and advancement strategy, into regional territorial strategy and applicable domestication of building codes to regulations and infrastructure development standards. An essential action backing this would be the setting up of a user friendly; if possible a polyglot (local languages) Geographic Information System (GIS) on both urban centres and regional territory disaster management plans on the information superhighway. It should be connected to a general data bank (also to be established) that keeps details of housing and land ownership information, building permissions and government assets in public services and systems. This would become the structured basis within which community and urban regeneration and development are synchronised with adaptation and mitigation. A homeowner – business sector – government collaboration to fund, construct and retrofit houses and public infrastructures to disaster resilient standards at community stage and a PPP strategy to tackle flooding, erosion, desertification and all other challenges at city level will need to be looked at for every city.

**THE BUSINESS SECTOR LEVEL**

Assuming the accessibility to a generally open hazard adaptation framework, the private sector should be stimulated to create the right risk assessment, adaptation and mitigation strategy for all and sundry (individuals, firms, etc.) in susceptible areas. This would allow for a sense of balance between demand and supply initiatives, for example; devolution and dissipation of amenity franchises.

**CIVIL SOCIETY ORGANIZATIONS LEVEL**

These groups ought to be spearheads in giving support and organising awareness on adaptation schemes focusing on the delivery and augmentation of infrastructures and general privileges, steer the community model projects to assess different ways of community-based adaptation, purposely for Nigerian favela and informal settlements and susceptible persons and groups. CSOs can give independent response and reactions, checks and balances on the effective operation of private and public component set-ups overseeing disaster and climate change risk adaptation and mitigation.
CONCLUSION

The degree of coming in contact with hazard in Nigeria is unpredictably certain; vulnerability in most cases causes more risk in her communities. Decreasing this susceptibility will mean a change in public policy, mobilization and innovativeness from palliation for adaptation. This requires to be established in the actual institutions, politics and culture of Nigeria and needs to concentrate on the impoverished and vulnerable persons via a combination of strategy, monitoring, financial systems, official and supporting channels. This is most likely highly executable by integrating climate change, risk assessment, mitigation and adaptation activities into current programmes, and developing a series of substantial relations with community redevelopment interventions being advocated and started in some Nigerian communities.

Achieving this needs operating several levels of adaptation framework, which functions at federal, state and community (local government/city) levels and connects civil society organisations, the state and private sector. Testing by implementing a rich and all-encompassing adaptation programme in a number of model communities will allow for further investigations into adaptation.

REFERENCES


Iguisi, EO., 2011. Disaster risk and adaptation to climate change in Nigeria, Centre for Disaster Risk Management and Development Studies, Ahmadu Bello University Zaria, Nigeria.


SPACE, ARCHITECTURE AND INFRASTRUCTURE “IN-BETWEEN CITIES”. GDANSK - SOPOT CASE

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Abstract

Division of the city, infrastructural barriers, empty spaces, no man's land with chaotic development, cut-off areas, which we can observe in many big cities, threaten the city's image and functioning. Urban planners world-wide are discussing how to stop these processes leading to disintegration, aesthetic disturbance and ugliness, but still we have no satisfactory solutions. The problems can best be observed in the areas in-between cities. One of the main questions for urban planners and architects seems thus to be: how to connect the city spaces instead of creating the barriers, how to create the areas “in-between” friendly, safe and attractive?

The presented case study, related to the space, architecture and infrastructure between Gdansk and Sopot in Poland, illustrates the issues arising from the wrong spatial planning systems and the lack of a coherent policy between the neighbouring cities, causing spatial, functional and visual barriers. The article presents some ideas and guidelines helping to solve such problems. The set of integrated mitigation measures such as environmental policy, spatial and urban planning, metropolitan plans, SEA/EIA system and landscape architecture which are still not sufficiently implemented in practice in Poland, has been presented. They can be used to protect and enhance a unique environment, cultural heritage and landscape and to create new values, like attractive public spaces in-between cities.

Keywords: infrastructural barriers, values, threats, divided cities, mitigation measures.

INTRODUCTION: PROBLEMS OF DIVIDED CITIES

One of the main sources of threats to the urban environment is excessive and often unjustified development of traffic communication. The New Athens Charter of 1998 classifies five main problems of the modern city, including air quality, level of noise, the quality of the housing stock, size and access to green areas, and transport.

Soil, water and air pollution, noise, harm to health, consuming non-renewable raw materials, the huge demand for land, and congestion are being classified as negative effects of transport growth. The Athens Charter of 2003 added to these negative effects: creating barriers and obstacles, fragmentation of the neighbouring urban systems and landscape structures. As a consequence, most of these negative effects are being revealed in a degradation of landscape.

World experiences show that the increase in the number of road connections not only fails to meet the growing transportation needs, but even further complicates them. Construction of new routes does not meet new transportation needs. New roads are immediately filling with cars so there is a growing need for further realizations.

Demands for the technical parameters and scale of new connections are growing, because of technical progress and the increasing needs of users. That can cause an increase in the number and speed of vehicles. Growing demands connected with safety requirements force the widening and straightening of routes. Thus, it becomes possible to overcome almost any barrier, used in the construction of city streets under the toughest conditions.

As a consequence, the development of road construction, absorbing more and more areas including often the most valuable ones, threatens the quality of the environment and landscape of the city. The number of transportation areas in Poland is slightly lower than the settlement areas (964 thousand hectares to 1035 thousand hectares of settlement areas in 1999) but road transport in cities is a source of almost 70% of contaminations, even though the roads are only 3.2% of the country's area. The effect of densification of the traffic system is increasing the “shredding” of space. This is followed by a loss of density and compactness of the city, shredding tissue, disintegration of landscape, destruction of natural ecosystems, changes in the physiognomy of the area, the interruption of natural, functional and compositional connections. One cannot deny the truth of professor Bogdanowski's statement, that: “transportation grows to the size of a terrorist today”.

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CASE STUDY

Introduction to a case study
The urban planning effects at the border of Gdansk and Sopot exemplify the problems created by road infrastructure dividing the city. The discussed area is bordered by Gdansk to the south and by Sopot to the north. Gdansk is a thousand-year old port city of 455 thousand inhabitants, while Sopot is a small historic city of 40 thousand inhabitants, and a health resort and watering place. They are both located on the coast. Gdansk, Gdynia, Sopot and a few smaller towns create Gdansk Agglomeration, located on the northern coast of Poland.

The subject of discussion is the realization of two big investments at the border of the two cities: the Green Road and the Sport Hall Ergo Arena. The lack of coherent metropolitan policy between the two cities (despite the agreement of both cities), resulted in their separation by the new road. There is no coherent system of public space around the new sports hall that could link both cities and exploit the unusual qualities and potential of the site.

Values of the area

Surrounding areas
The surrounding area consists mostly of valuable and protected zones and elements of natural and cultural heritage. From the west side, it is surrounded by beautiful hills called Tri City Landscape Park and from the east, the water of Gdansk Bay, which is a Protected Area Nature 2000 - part of the European System of Protected Areas. From the north, the area is surrounded by the listed historical area of Sopot, from the west by a pulmonary hospital and Caritas Hospice in historical “Stawowie” Park and the urban structure of Oliwa with its residential wooden houses from the 19th/20th century. From the south, the area is bordered by residences of Gdansk. It is high density, multi-family housing with a population of 7 to 11 thousand inhabitants per square kilometre. Part of the surrounding is retail, service, craft and storage areas.

All these circumstances create serious planning limits. The decision to construct the road and sports hall in this area would always cause conflicts. The question in this case is not how to eliminate, but how to minimize it.

The area of analysis
The several hundred metre wide strip on the border of Gdansk and Sopot until recently was a green extensively used terrain, with unique natural, cultural and landscape values.

Figure 1: The eastward view of the Baltic Sea and undeveloped area before Sport Hall Ergo Arena construction (Photo J. Zelazny).

Figure 2: The westward view of the Tricity Landscape Park and undeveloped area before Ergo Arena construction (Photo J. Zelazny).
The border area of Gdansk and Sopot is covered by different forms of protection: environmental, natural, cultural, landscape, ground water resources and spa. There are protection zones related to monuments, visual exposure and landscape of Sopot.

The 500 ha area consists of several zones laid in a characteristic, linear pattern, parallel to Gdansk Bay. From the east, the area of the Coastal Strip is located along the Gdansk Bay within the administrative boundaries of Gdansk and Sopot. The belt extents 6 kilometres in length and 800 metres in width. The unique European strip of coastal dunes, forests, and sandy wide beach make an attractive landscape.

The allotments located on the flat, lowland area are located to the west of the sea. The Graniczny Stream, totally hidden underground in pipes, flows through this area. Groundwater occurs in 3 - 12 metres above sea level. Based on groundwater resources, the deep sea water intake called ‘Bitwy pod Plowcam’ is functioning. The most valuable element, which creates the unusual identity of the place, is a historical object of Hippodrome together with a racecourse lying on the western side.

The beginnings of the Hippodrome date back to the 70s of the 19th century. In 1898 horse races started. Then the wooden stands for 2300 people, totalizator hall and horse track were built. Sopot is one of three existing classic racecourses in Poland. The Hippodrome consists of listed historical buildings, as well as contemporary buildings built after 1945.

Some works connected with a revitalization of the Hippodrome are being carried out. The revitalization covers all the investment works related to building new elements, renovation of existing ones and development of the public space. The effect of the works is a modern horse riding centre, whose main core are the historical buildings of Hippodrome located in extensive green areas.

Before the road division, the area of analysis had tremendous potential due to the proximity of the sea and sandy beach from the east as well as sport, horseracing functions from the west and undeveloped green areas. The moraine hills of Tri City Landscape Park visible from all over the area at 150 metres above sea level create added value. The events like Pope’s Mass in 1986 and the concert of Tina Turner took place here. It proves that such places for mass events are still needed in Tri-City.

**Key element I – route Green Road**
The Green Road cuts an area between Gdansk and Sopot in a trench route, creating an unsurpassable technical barrier. As part of a larger communication net called Via Hanseatica, it runs through the Tricity Agglomeration as a basic system. The role of this system is to take traffic from congested and blocked Tricity transportation system. Otherwise, it provides also a route to the Sport Hall Ergo Arena.

The considered 800 metre part of the Green Road was built on the border of Gdansk and Sopot in the neighbourhood of large housing estates (Zabianka, Wejhera). Two variants of implementation of this fragment of Green Road were considered: a viaduct and an open trench. Before the formal procedure commenced, an ecological study for this fragment was prepared. Both variants were rated as threatening to the environment and development, but the tunnel indicated as less conflicting.

The authorities of Gdansk and Sopot, which together were planning and co-financing the road, have chosen to implement a variant of the trench. The road was opened in 2012. The construction of the road necessitated the building of the tunnel under the railway line. The 28 metre pedestrian- bicycle route had to be constructed to link Subislaw Street at Zabianka estate with Sopot’s Hippodrome.

**Key element II – Sport Hall Ergo Arena**
Sport Hall Ergo Arena is located on the border of two cities, Gdansk and Sopot, 3 kilometres from the centre of Sopot, 10 kilometres from the centre of Gdansk and 1 kilometre from the coastline of Gdansk’s Bay. Several dozen hectares of land, on which the Sport Hall is located, also includes a parking area. Ergo Arena can host up to 15000 people, which allows the organization of the whole spectrum of different events and activities, making this place unique.

**The history of building of Ergo Arena**
The history of this investment started in August 1999 when the Office of Physical Culture and Tourism together with Polish Sports Associations agreed to build the multifunctional sport and entertainment hall. In
2000 the authorities of both cities signed the agreement about the partnership. The winner of the nationwide open SARP competition for architectural and urban design was chosen. In 2005, Gdansk and Sopot signed another partnership agreement under which both cities are equal investors but the leader of the project is Sopot Municipality. Hall construction began in 2007 and finished in 2010.

**Multi-functionality of a building**

The building consists of a main hall and secondary sports hall. This enables the organization of sports events of the highest rank in most indoor sports (basketball, volleyball, handball, hockey, ice hockey, tennis, table tennis, badminton, horse riding, martial arts, athletics, motorsports, windsurfing). It can also be adapted to the organization of concerts, theatre and opera performances, film screenings, conferences, exhibitions and fairs, business meetings, banquets, shows. The main building is made up of two parts. The first one is a massive, reinforced concrete base partially hidden underground and contains the two lowest levels of the object. The second one is a cylinder of light curtain walls with steel frame covered with perforated sheets of titanium – zinc. The Indoor Athletics World Championships were held here in March 2014 because of the building's multifunctional character.

**The problems of the case study**

Despite the lengthy planning of both objects, and numerous studies and expert opinions, after their completion, many doubts have arisen regarding the real negative effects of the implementation of the route and indoor arena.

The assessment of the case study proves that the broad paved space of a technical nature has been made on the biologically active area. There was irreversible damage to the urban fabric of this part of the agglomeration. The route, due to its parameters and traffic, cut the functional and spatial structure in-between Gdansk and Sopot, and at the border of housing and green spaces, sports and recreational areas.

![Figure 3: Green Road (Tricity Landscape Park visible in the background, Hippodrome on the right, housing estates on the left) (Photo A. Sas-Bojarska).](image1)

![Figure 4: Green Road. Big housing estate visible on the right, behind the noise barrier. Ergo Arena visible in the background (Photo A. Sas-Bojarska).](image2)

Although the road in trench is less harmful to the landscape than a viaduct, it still creates serious visual threats due to its scale and dimensions. It does not complement the historical buildings. It creates an artificial barrier to the long strip between Gdansk and Sopot. The road in a trench has eliminated a lot of connections and inhibited the transitions that now can only be made by pedestrians and a cycling footbridge. A broad technical barrier between the two cities of Gdansk and Sopot has been created. The big scale of the road is being intensified by the noise barriers. Poor visual effects are enhanced by the uninteresting form of screens and bright, randomly chosen colours that are a permanent part of the development, disturbing the previous harmony and character of the landscape. The visual barrier has appeared in-between great housing estates and recreational areas.
The large width and cavity of the route worsened the conditions of using the area close to the Green Road, in particular the coastal green belt and the Hippodrome. The permanent separation between the recreational, sport and cultural areas from housing areas has occurred. This aggressive investment destroyed attractive views, both for inhabitants as well as for walkers and tourists. In conclusion, the quality and comfort of life of inhabitants, living next to the route, has been lowered.

The planned investment runs along the edge of the areas that are precious due to their cultural values. At a considerable distance as a large-scale, linear object it interferes visually in the protected zones of Sopot.

The route made it necessary to canalize the local stream from the discharge place to the Hippodrome. In urbanized areas, converting open streams to underground canals is not beneficial in the long term because, despite the negative changes in the natural environment, it reduces the natural water retention and increases the risk of flooding.

Because the Sport Hall is located quite far from the local train stop (about a 15 minute walk), it limits accessibility to the public communication stops. Such a localization requires a large amount of parking around the facility and is promotes individual communication instead of public transport, which is not an environmentally friendly solution.
Of course, the choice of localization of such an object open for all residences of the agglomeration is indisputable. It is very important, especially in a situation while in other parts of Tricity, housing estates are being built by developers in the valuable areas. They are causing the effect of shredding the urban space as in the Coastal Strip of Gdansk. The localization of this Sport Hall is better than the developer’s investment.

With such a powerful investment, the public spaces surrounding the hall could have developed and connected two divided urban structures. Unfortunately, it did not happen. The area surrounding the hall is still undeveloped, littered, dark and dangerous.

The conclusion of the case study
The agreement between the authorities of Gdansk and Sopot concerning the Sport Hall failed to include the goals of sustainable development in a wider urban context. This decision cut an urban tissue. The huge technical barrier between housing and sport-recreational areas has been created and the landscape has changed.

An area directly close to the Sport Hall has been designed and arranged as a typical hardened and visually unattractive technical space. An extraordinary location due to its proximity to the coastal strip and the historical Hippodrome has not been used. The whole area in-between Gdansk and Sopot should be attractively landscaped with attention to the potential of space, and should offer sport, recreational and cultural functions for the whole agglomeration. There are wonderful opportunities for urban development for public spaces, available and beautifully arranged.

The problems that have arisen in the planning and implementation of investment on the border of Gdansk and Sopot are the result not only of individual decisions but most of all they are the effect of an erroneous spatial planning system in Poland. Therefore, a closer look should be taken at these more general reasons.

PLANNING CIRCUMSTANCES IN POLAND

The complicated planning situation in Poland in many cases precludes the implementation of the principles of sustainable development in urban planning. Although there are a variety of planning tools, their inconsistency, ambiguity and constant changes make them ineffective.

Spatial planning in Poland – system or chaos?
The spatial planning system in Poland cannot be assessed positively, due to many circumstances. The Act on Spatial Planning and Development (March 27, 2003 with subsequent amendments) defines the principles of spatial policy-making and regulates the processes of spatial management in Poland. This act specifies the division of tasks and responsibilities between different levels of public administration in the field of spatial planning and determines all details.

The general structure of the spatial planning system in Poland is divided into the national, regional and local level, which respectively consists of the:
- National Spatial Development Concept,
- Zoning Plan for the Region,
- Study of Conditions and Directions of Spatial Development, Metropolitan Plan and the Local Spatial Management Plan.

The reform of the Polish Planning Law, which began after 1989, aimed to increase the supply of investment areas in cities, which resulted in a significant liberalization of building regulations. The liberalization of law, as a reaction to previous socialist system constraints, stimulated by a postmodern tendency to deregulation, led to a significant fall in spatial management. According to many experts, the current planning system in a market economy leads to chaos or even results in cluttering of the Polish space.

The main reason for the state of affairs presently is the resignation from the formerly existing General Plans and their replacement by the Study of Conditions and Directions of Spatial Development. It has only a recommendatory status and is not an act of local law. Basic tools of local spatial development are covered by the Local Spatial Management Plans. However, there is no legal obligation for creating Local Plans in Polish Planning Law. Hence, they are mostly prepared voluntarily and many municipalities treat it as a redundant expense.

Environmental Assessment Procedure
One of the tools supporting spatial planning and decision making in Poland is the Environmental Assessment System. It consists of:
- Strategic Environmental Assessment (SEA), related to spatial plans, strategies and policies,
- Environmental Impact Assessment (EIA) - related to activities that may be harmful.

The SEA/EIA system improves the process of planning, construction and operation of new activities, plans and strategies. EIA is often being used improperly in Poland. In spite of how useful this system is in theory, we can observe weaknesses that lessen its potential and cause many spatial and landscape problems:
- EIA is often treated by investors as only a formal requirement; necessary for gaining building approval.
- Analyses are concentrated on quantifiable factors, like air, water, or noise pollution.
- There is no cooperation among experts from different fields.
- “Non-material” aspects, like landscape – as not “objective” - are usually ignored.
- Landscape is treated as isolated and a less important element of the environment, because it is not quantifiable.
- There is no systematic approach to prediction of landscape changes.

The current practice of predicting impacts has been based mostly on the independent investigation of individual elements of the environment. All these factors determine the low effectiveness of environmental assessment systems in Poland.

Metropolitan Plan
The Metropolitan Plan, dedicated, according to Polish law, to main metropolitan areas, is a new planning tool. The need for implementation of the Metropolitan Plan should be indicated at a higher level, which is a Zoning Plan for the Region. It is being taken into consideration also when making the National Spatial Development Concept. The Metropolitan Plan determines the rules of space management, and it is being resolved for an indefinite period. It is not a law as in a Local Spatial Management Plan. It defines only the general localization of a certain investment or an enterprise, in accordance with the Zoning Plan for the Region. It does not replace in terms of law the decision of building and spatial development conditions.

The Metropolitan Plan followed by a Strategic Environmental Assessment would improve the policy of cohesion and integrity between Gdansk and Sopot.
GUIDELINES

In the case considered, the effects of spatial and urban planning might have been much better for the sustainable development of Gdansk and Sopot if such tools like a metropolitan plan, SEA/EIA system and landscape architecture were better used. But the most important should be the implementation of the general principles of sustainable development. They can be found in such documents as the Constitution of the Polish Republic, the National Environmental Policy and other development strategies, coherent with EU polices, which are still not sufficiently implemented in practice in Poland.

Planning guidelines

Metropolitan Plan

The idea of a Metropolitan Plan has emerged to ensure the proper development of complex structures of metropolitan areas. In such big structures, different conditions can be examined only in the wider scale of a whole area. This kind of metropolitan area is certainly Gdansk, Sopot and Gdynia. The Metropolitan Plan would enable a complex investigation of the planning conditions and realization of the most important goals of the whole agglomeration. Obligatory SEA procedures would assure all environmental circumstances and impacts are taken into consideration.

The Metropolitan Plan would allow for optimal planning connected with the development and transformation of an area in-between two cities. In particular, the spatial relationship of the two cities and Sport Hall and its transportation system would be considered. It should refer to landscape and hydro-geological analyses and different conceptual designs of technical infrastructure and roads regarding spatial, functional and compositional relations with Gdansk and Sopot. Such a plan should also take into account the status of the health resort of Sopot and the principles of management in this different area. The plan should give the general conditions of landscaping in a landscape protection zone which includes the entire town of Sopot. The implementation of the Metropolitan Plan requires public participation, which would help with the social involvement and engagement of local communities.

EIA

The Green Road cuts the area of many different formal, spatial, environmental and landscape circumstances. Therefore, the EIA procedure should have been conducted not only as a formal procedure, but with the highest respect to best practice and all circumstances.

In such a complex and important case, the potential effects in all elements of the environment, as well as effects on peoples’ life and well-being, should have been recognized and assessed. The indirect, long-term, cumulative, permanent, irreversible and unavoidable impacts should have been indicated, as well as their spatial scope, scale, significance, and the uncertainty of the prediction.

In this case, the prediction and assessment of changes in hydro-geological and hydrological conditions seemed to be crucial. Hydrological effects would have been the result of a cut-off of the natural migration ways of underground and surface water. It should have been important to assess indirect changes in the quantity and quality of underground water intake and mineral water intake. The magnitude and significance of changes in air quality and noise should have been predicted, related to housing and recreation areas. Adequate mitigation measures should have not destroyed the landscape and character of the area. Regarding the unique character of Sopot, a health resort, and touristic town, named ‘Pearl of the Baltic sea’, it should have been crucial to predict negative impacts related to cultural heritage, landscape, and visual quality of the space. These impacts would have been caused by new infrastructural objects (tunnel, stabilization walls, noise barriers). Landscape studies and landscape architecture planning related to land use, land surface, engineering objects, small architectural objects, materials, colours, greenery, lighting should have been necessary. The design process of engineering objects should have been treated as a chance to enhance the visual quality of space in the area between Gdansk and Sopot.

We may assess, observing the state of the space after construction phase, that the EIA of the Green Road was not a success. The real landscape and visual impacts are on a big scale, negative, and non-reversible. The new road and noise barriers became controversial. The cut-off space became extremely technical. The area lost its natural character and local identity.
Project guidelines
The approach to resolve the problem of dividing city space should be based on the following rules:

• Instead of cutting the valuable urban tissue with new roads, it is better to improve the public transportation system. As an example, a case of Curitiba can be mentioned, where the unique transportation system based on a combination of aspects such as: organizational, economic, spatial planning and design, has been implemented. There are many possibilities to improve the public transport system in the Tricity case, like in Curitiba. Existing rail, tram and bus systems should be developed, which would decrease the need to build new roads. The Green Road should have been planned as a local road rather than a transit road.

• Excessively wide roads that create barriers should not be designed in the urban tissue. For the needs of transit traffic, existing artery roads should rather be used and modernized or covered tunnels should be built.

• A valuable urban tissue of natural, cultural and landscape values should not be wasted for technical functions. A perfect example is Regan’s’ Park in Gdansk, located near the studied area, where the allotments were converted into the public park for all residents of Tricity and tourists, becoming a favourite place of recreation. The open green area around the Ergo Arena should also be converted into a public park.

• If the urban tissue must be divided, due to transportation needs, this problem should be minimized during the design process. The perfect example of using technical space for urban function is the area under the viaduct in Darling Harbour in Sydney, where an attractive public space for residents has been designed.

• In a situation where the space is already divided, high quality connections between the surrounding areas should be created, which did not happen in this case.

• Landscape architecture should be used to create new landscapes. For this purpose, some actions should be considered:
  a. Development of a system of public green spaces that link the separated areas,
  b. Recreational development around the Sport Hall Ergo Arena (new sport and recreation programme, a tourist information system, buffer zones),
  c. Use of landscaping to improve the quality of space (slopes, retaining walls, stairs, walkways, acoustic screens of attractive forms and colours, street furniture, flooring, green, lights, colours).

Such actions would prevent the occurrence of a number of negative effects implemented in this unique area.

CONCLUSION
The space between neighbouring cities, often recognized as no-man’s land, may undergo strong and uncoordinated investment pressure, which results in chaotic development, divided spaces, and many negative environmental impacts. Some impacts are irreversible and permanent, while some may be minimized, although mitigation is usually time consuming and costly. Avoiding potentially threatening impacts through effective urban planning is better than repairing negative changes.

Each city has its own circumstances and directions of sustainable development. However, some cities require special protection and enhancement of their unique environment, cultural heritage and landscape. The case study from the area between Gdansk and Sopot proves that we can easily destroy spatial, functional, environmental and landscape values. In order to avoid such destruction, the need to think of a metropolitan area as one resilient organism, in terms of integrated space, environment, transport and society, arises. The areas in-between cities should connect, not divide, as we observe in the case study of Gdansk and Sopot. Considering the wider circumstances and urban context should be the key elements of planning in-between spaces to protect what is valuable: local identity, environmental and landscape values, and to create new values – like attractive public spaces.
REFERENCES


PLAYGROUND TYPOLOGIES AND MATERIALITY FOR SUSTAINABLE PUBLIC OPEN SPACES IN AN URBAN CONTEXT

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Abstract

The process of urbanisation will result in an increase in population densities and extended land usage. The need to maintain and provide sustainable public open spaces within future and existing urban developments will therefore become more critical.

Presently, there are still a large number of undeveloped sites in the older suburbs of Johannesburg bordering on the inner city. These sites are owned and maintained by the City of Johannesburg and provide public open spaces ranging from small pocket ‘parks’ to large destination parks, many of which incorporate some form of playground equipment.

Research was conducted on a sampling of public playgrounds within these ‘park’ settings to establish: space utilisation and layout, the type of play equipment and subsequent play opportunities provided for children, the general condition of the playground equipment in relation to vandalism and maintenance, and other facilities available on the site.

All authors writing on childhood development concur on the benefit of play for healthy development, with specific importance placed on outdoor play. However research has shown that the traditional forms of playground and play equipment design, which prevail in the majority of public parks surveyed for this study, do not adequately meet the developmental needs of children. They are also proving to be unsustainable within this context.

The aim of this study was to establish design criteria for alternative playground typologies for public playgrounds and play equipment, in order for them to better meet the developmental needs of children, and in turn contribute towards the sustainability of public open spaces in poorer urban areas. Examples are discussed that were developed within the constraints of the established design criteria.

Keywords: playground typologies, public open spaces, childhood development.

INTRODUCTION

This paper advocates that in order to make public open spaces sustainable they should be designed and managed in such a way that truly benefits the communities they are meant to serve.

Although specific focus is placed on children’s playgrounds, the need for context-specific design solutions to address spatial development and socio-economic problems that co-exist within a city, are also considered. The playgrounds that are the subject of this study are situated in a variety of public open spaces owned by the City of Johannesburg (CoJ) and colloquially referred to as ‘parks’ and they are managed and maintained by Johannesburg City Parks department (JCPZ 2008).

Concepts of childhood development theory and theories pertaining to urban public open spaces are used to frame the discussion regarding the design of sustainable public open spaces (POS). This study posits that it is the design of POS that will ultimately determine their sustainability.

Sustainability of POS

If POS are not sustainable they may disappear due to increasing land demands associated with densification of urban centres. Sustainability can only be achieved if economic, social and environmental concerns are equally addressed (Du Plessis 1998, p. 45). In the interpretation and principles of the current by-laws, there is no clear distinction made between environmental and social sustainability. Humans and the environment are grouped together in terms of policy that is intended to: minimise harm, maximise benefits and comply with legislation intended to protect the environment and human health and safety (Public open spaces BY-
Although social sustainability is considered integral in sustainability measurements, it is assessed according to its own criteria. The measure of social sustainability of POS should be determined by the extent to which they are used, and the degree to which they actually benefit the public’s needs.

In an ethnographic study of Joubert Park, situated in the inner city of Johannesburg conducted by Marais, she is critical of current policy governing the use of POS. Marais (2013, p. vi), claims that the CoJ has rules and regulations that aim to exclude certain users from the park. In the process of enforcing these ‘rules’, the City ignored its own responsibility as laid out in the by-laws. It also became apparent that the City’s ideal users are different from actual park users and this causes conflict around the use of public spaces, making them socially unsustainable.

However it is not only ‘poor’ policy that excludes certain users from these parks but also ‘poor’ design decisions that contribute to the social unsustainability of these spaces. Although some of the reasons may be historical, many of these spaces have not been adapted or redefined to meet contemporary society’s needs.

The managing agent

Johannesburg City Parks (JCP) is responsible for all the playgrounds and ‘parks’ in which they are situated. Currently JCP manages 2 343 parks. It is also responsible for the management of cemeteries, open green areas, street trees and conserved spaces equalling a total area of 22 278 hectares (JCPZ 2008). This agency was created specifically to take care of parks and environmental concerns by the CoJ. It was incorporated as a section 21 company in the year 2000. A section 21 company is not intended to make profit but to provide services, “in a manner that is efficient and business like” (Nel, cited in Marais 2013, p. 159). However there appears to be a conflict of interest as to whether the current developments, use and maintenance of public spaces (in general) is actually ‘in the interests of the whole community’ or in the interest of the managing agent.

As play is considered to be such an essential part of childhood development (Isenberg & Quisenberry 2002), it is important that quality play spaces are preserved and made available to all residents and specifically those in medium and high-density, low-income residential neighbourhoods. This premise is actually supported in by the 2040 Growth and Development Strategy’s outreach process (CoJ 2011, p. 107). Some of the key principles/strategies relating to the regulation, management and use of public space, read as follows:

- Encourage public spaces that offer diversity and flexibility in both purpose and use.
- There is a need for people to live, work, learn and play in close proximity.
- Make allowances for the poor in terms of the regulation and management of the built environment and the use of public space.

The CoJ also has a Public Spaces Charter to uphold (c.2006). This charter aims towards creating a ‘liveable’ inner city, with culturally appropriate and authentic public places that are accessible to all. The CoJ aims to increase the number of quality public parks and playgrounds within or immediately adjacent to the inner city. It is also stated that in line with these objectives, “all new and refurbished public open spaces will be designed, developed and upgraded in a manner that is compliant with ecological best practice” (CoJ c.2006). This objective however needs to be expanded to include both social and economic ‘best practise’ if sustainability of these spaces is to be achieved.

Design for social exclusion

In theory, POS in urban areas should be democratic spaces that “provide opportunities for a wide range of activities and benefits relating to: social, environmental, physical and mental health and economics” (Dunnett et al. cited in Woolley n.d. p. 4). Public open spaces should be designed and managed in such a way that people living in urban areas can realise the full potential of these benefits. Residents need to be able to readily access these spaces and use them freely. If individuals, through no fault of their own, are unable to use such spaces in ways they would like to, then this can be defined as a form of social exclusion (Woolley n.d. p. 2).
There is also a trend towards greater regulation of public spaces, often justified by the need for improved ‘safety and security’. These ‘exclusionary practices’ vary in application and are dependent on existing social relations, political practices and cultural traditions in different locales and institutional settings (McCahill, cited in Dohety et al. 2008, p. 91). Design is used extensively for this purpose, for example, “through surveillance and monitoring devices, access and security systems” (Graham & Marvin, cited in Dohety et al. 2008, p. 291). Design for exclusion also happens on a smaller scale, such as a park bench designed in such a way that it is too uncomfortable to be slept upon by a homeless person. Social exclusion can also however, be the inadvertent result of poor or inappropriate design solutions.

It is from this position that I would like to suggest that the current design and (resulting) management of many children’s playgrounds situated in POS are inadvertently creating a form of social exclusion (if play is considered a normal activity) by not providing appropriate benefits for the residents they are meant to serve. This may ultimately render them unsustainable.

Historical context - the ring of blight
The public playgrounds that were the subject of this study are located in the suburbs that border on the eastern side of the inner city of Johannesburg. These suburbs were initially established for working class residents during the period 1889 to 1904. The suburbs at the centre of this study and the dates they were established are: Troyeville (1891) Bertrams (1889), Lorentzville (1892), Judith’s Paarl (1896), Bezuidenhout Valley (1902), Kensington (1903), and Malvern (1904) (Residential development in Johannesburg n.d.). These heritage suburbs are representative of similar developments to the west and south of the inner city. The land usage of these suburbs has remained largely unchanged with the majority of new developments radiating outwards and away from the inner city. This trend has continued up until the present. These ‘poorer’ residential suburbs bordering the inner city have all suffered various degrees of urban decay over time, to the extent of being referred to as ‘the ring of blight’. Some of the more decayed areas have been redeveloped into sporting and educational precincts or re-zoned for light industry.

Figure 1: Eastern portion of early plan of Johannesburg suburbs 1897 (Source: Wiredspace, 1897, amended by author).
What is noticeable from this early map of Johannesburg (See Figure 1) is that no large parks or POS were established within the inner city (with the exception of Joubert Park (Marais 2013, p. 143), with a tendency towards smaller neighbourhood ‘parks’. This may have been due to the fact that at this time the urban fringe was within walking distance of the inner city, offering unlimited access to open spaces and play opportunities for children. Of more significance to this paper is that (despite an ever-increasing population density), the allocation of POS has remained largely unchanged. This can be determined in an overlay of a portion of the original plan of Johannesburg, with a recent satellite image of the area (See Figure 2).

Figure 2: 1897 map of Johannesburg overlaid on 2013 Google image (Source: Compiled by author 2014).

THE RELATIONSHIP BETWEEN OUTDOOR PLAY ENVIRONMENTS AND CHILDHOOD DEVELOPMENT

The literature consulted relating to outdoor play and playgrounds is compiled from the premise that play is critical for human ontogeny. Play has in recent times been neglected with more importance being placed on formal teaching as the key to learning and development. Prior to this period most cognitive development in children occurred through observation, exploration and play (Pellegrini, Dupuis & Smith 2007, p. 263).

All authors concur that playgrounds offer crucial and vital opportunities for children to play, and in turn, that; “All learning, emotional, social, motor and cognitive, is accelerated, facilitated and fuelled by the pleasure of play” (Duerr Evaluation Resources n.d. p. 1). Play is now considered to be essential for brain development and is related to the development of intelligence, certain academic and reasoning facilities. A lack of free and spontaneous play can be detrimental to the developing child (Frost et al. 2004, p. 10). Outdoor play provides many benefits for children and provides opportunities to expand their range of activity (Isenberg & Quisenberry 2002, p.5).
In order to determine the developmental benefits associated with play, play is categorised by different play types or play forms. These include: Functional or Sensorimotor play, Social play, Constructive play, Pretend or Fantasy play, Games with Rules and Free play (Mentin 2003, p. 16-20). Research has shown that the content of the outdoor environments has a direct impact on children’s outdoor play, and that the play-type directly impacts on childhood development (Naylor, 1985, p.125). Therefore it is imperative to identify design methods and processes for producing quality outdoor environments that promote development and learning in children (Herrington & Studman 1998, p. 204; Mentin 2003, p. 88).

FINDINGS FROM THE SITE SURVEYS

The majority of research and resulting literature relating to playgrounds is written from a childhood development position. There is however far less research conducted from a design perspective. This is despite the fact that the manner and frequency with which the playgrounds and equipment are used by the children, and therefore the developmental benefits derived from these forms of play are inherently bound-up in the design of these spaces. It was from this premise that a survey of eight playgrounds was conducted over a period of five years. The playgrounds are located in both “public utility public open space” and “recreational public open space” as defined in the (Public Open Spaces BY-LAWS 831/2004) (CoJ 2004, p.5). The ‘range’ of playgrounds is situated in demarcated small neighbourhood parks, demarcated destination parks, non-demarcated public utility and marginal spaces. The objective of the site surveys was to establish:

• The type of play equipment on site and subsequent play opportunities provided.
• General condition of the play equipment with regard to vandalism and maintenance.
• Recent design interventions on the sites.
• Accessibility to the site and play equipment for differing ages and abilities.
• Settings and other facilities on offer.

The aim of the research was to establish design criteria for playgrounds that holistically contribute towards childhood development and the sustainability of POS in which they are situated. The parks that were surveyed were classified into the following types:

Large destination park:
Rhodes Park: 390 000m² in total with a dedicated play area of approx 10 500 m².

Demarcated neighbourhood parks/community centres:
Fuller Park: 6 500m². Received upgrade during the 2003/2004 period and again in 2010.
David Webster Park (Previously Troyeville Community Park): 9 360m². Received upgrade during the 2003/2004 period and further upgrade to sporting facilities in 2013.
Bertrams Park: Upgraded in 2010.

Non-demarcated public utility and marginal spaces:
Fotheringham Park: 191 053m². No maintenance to playground since 2008
Alexandra Park: 204 912m². No maintenance to playground since 2008
Compound site: 31 857m². Recent installation during 2002/2003 period
Hofland Park: 16 845m² in total with separated play area of 1 600 m². Playground equipment relocated to fenced-off area in 2012.

Play opportunities
Without exception all the playgrounds surveyed for this study would be considered as traditional playgrounds which make use of traditional play equipment.

The design of these types of playgrounds dates back to the early 20th century. As a result of mass urbanisation of factory workers, these playgrounds were primarily developed for the benefits of poor children growing up in crowded city conditions (Mentin 2003, p. 23). The playgrounds were often situated on hard level surfaces to accommodate popular ‘street games’ played at the time. The lack of grassed surface on which to play was a reflection of management policy rather than the preference of children.
The main goal of these ‘designed’ playgrounds was to attract children away from the hazardous streets and vacant lots and into a ‘safer’ play environment.

Traditional playgrounds are equipped with swings, slides, merry-go-rounds, and jungle-gyms constructed from steel and timber. This ‘traditional’ playground equipment was primarily designed for large muscle activity in order to promote physical fitness (Mentin 2003, p.30).

The current playground area in Rhodes Park (See Figure 3) is an example of a traditional playground design. This playground has remained relatively unchanged since its initial inception. Some of the more recently upgraded ‘parks’ still rely heavily on this ‘traditional’ design solution.

**Condition of the play equipment**

The traditional play equipment manufactured mostly from steel and timber all shows varying degrees of vandalism and breakages. There is evidence of metal theft of components leaving the equipment unusable (See Figure 4). In some cases, entire pieces of equipment have disappeared. There is evidence of superficial maintenance of equipment such as painting and replacement of simple components. For example, most timber swing seats have been replaced with uncomfortable rubber straps. Unfortunately it is highly unlikely that the intricate cast-iron components and brass-laminated slides that have been looted will ever be replaced.
The site surveys revealed that playgrounds in non-demarcated public utility and marginal spaces were far more vandalised than those in secured areas. There was also no indication of any attempt to replace or repair broken equipment. The decisions to either cease all maintenance or relocate the playgrounds to within fenced-off areas (as discussed later) has the unintended consequence of excluding users from these POS.

**Upgrading of the sites, design interventions and unintentional exclusion.**

Fuller Park, David Webster Park and Bertrams Park all received upgrades as projects associated to the Greater Ellis Park regeneration programme, commissioned by the CoJ and implemented by the Johannesburg Development Agency (JDA 2005).

The David Webster and Bertrams Park projects included public participation and outreach programmes in the form of custom made artworks, mosaics and street furniture (See Figure 5) (Bertram’s Road Park n.d.). This was hugely successful in creating both novelty value and a unique ‘sense of place’.

*Figure 5: Custom designed furniture in David Webster Park (Source: Author 2008).*

The solutions for the play equipment were however not so novel, as traditional equipment sourced from catalogues was used. There was some consideration given to smaller children’s needs by providing more age appropriate traditional equipment.

Another significant play opportunity provided was a skateboard basin which has proven to be a ‘poor’ design decision (See Figure 6). A lack of adequate drainage resulted in the basin becoming flooded with rainwater, creating a cesspit. This is now completely dysfunctional and cannot be used as intended. Subsequent upgrades have been done to basketball courts and similar sporting facilities and the inclusion of a large chessboard, but unfortunately these seem to have restricted access.
Figure 6: Flooded skateboard basin at David Webster Park (Source: Author 2014).

Another example of a design solution that unintentionally contributes to excluding users is that of the upgraded Bertrams Park (See Figure 7). This park was intended to serve a "diverse community" and a primary school in the area which has no sporting facilities. The primary school formed a committee that would be responsible for maintaining the park (Bertram's Road Park n.d.).
However access to this park is restricted (See Figure 8). This park has been closed to the public on numerous weekend site visits. This is despite the by-laws stating that: (2.4.1) “Public open spaces must be managed, and where appropriate developed, in the interests of the whole community” ... and, (2.10.2.a) “The council must ensure that parks should be open to the public from sunrise to sunset” (CoJ 2004, pp. 6, 9). It can be assumed that the reason for the park being closed is (understandably) to prevent metal theft and vandalism. This action is justified by a ‘restriction of access’ clause in the public open spaces by-laws, which states: (2.8) “The Council may restrict access to any public open space or to any part of a public open space for a specified period of time” and, (2.8.b) “to reduce vandalism and the destruction of property” (CoJ 2004, p. 9).

The site surveys showed that traditional play equipment in unprotected areas is badly vandalised rendering the equipment useless and often beyond repair (See Figure 4). Therefore, the design decision to create this particular playground typology has had the unintended consequence of excluding users.
Figure 8: Bertrams Park closed to the public at 10:15am on a Sunday morning (Source: Author 2014).

The only other significant development made (to Fuller Park) was the addition of a football court with a concreted surface and low surrounding wall. This area does provide alternative play opportunities, even if used as unintended.

The relocation of Hofland Park playground to a secured area has not provided any alternative play opportunities. It is now in every sense a traditional playground situated on a hard-levelled concrete surface with no shade, whereas the original site was well wooded and grassed. This design decision appears to have been made purely for maintenance reasons.

Additional facilities on offer.
There are other less obvious but equally important design criteria that are not always considered, such as: shaded areas over play equipment, seating for child minders, ablution facilities, play opportunities for toddlers and barrier-free solutions. The lack of these types of facilities can result in the exclusion of certain users. Only Rhodes Park (as a destination park) has accessible ablution facilities on site, and the relocated Hofland Park has drinking water available. All upgraded parks have included seating for adults and child minders.

PLAYGROUNDS, PLAY EQUIPMENT TYPOLOGIES AND RESULTING DEVELOPMENTAL BENEFITS.
All the playgrounds surveyed for this study would be described as traditional playgrounds containing traditional play equipment. According to Naylor (1985, p.123) this widespread solution only really benefits the managing agent. The reasons are that they are relatively easily maintained, are readily available and can be ordered through catalogues as individual pre-manufactured items. This makes it is easy to predetermine costs, and they can be delivered and installed in a relatively short period of time.

However, Mentin’s research (2003) has shown that although these forms of traditional playgrounds support physical and social development, they do not support emotional development. They also do not offer opportunities for fantasy and dramatic play which fosters relationships and friendships, and “do not create stimulating and interesting challenges adequately” (Mentin 2003, p.84). This form of playground design does not take into consideration all the development stages of children. They also do not support cognitive development which is cultivated through constructive and imaginative play. Traditional play equipment is
indicative of highly predictable and repetitive play functions and is unsuitable for fostering mental development and creative thinking (Mentin 2003, p. 85).

A latter development in playground design developed in Denmark after the Second World War was the concept of the adventure playground. Basically children were observed creating and constructing their own play environments with available rubble, pieces of timber and other basic building and waste materials (Heseltine & Holborn 1987). Although these playgrounds manifest in a variety of forms, the fundamental principle is that: children create their own play environment and build their own play structures (Naylor 1985, p. 121).

These types of playgrounds go by the names of: Constructive playgrounds, Junkyard playgrounds, and Imagination playgrounds. Although by nature the design of these playgrounds differs greatly, they are based on similar criteria (compiled from various sources) in that:

- They have very few fixed facilities besides an office or storeroom.
- The majority of play elements/equipment are not fixed in position.
- The loose elements are intended to be arranged and constructed by the children as part of the play activity.
- The loose components are constantly rotated and alternated for novelty value.
- They provide multi-level recreational surfaces and can include sand and water features.
- They require supervisors to assist the children.

The main goals of the adventure playgrounds are: to promote the creativity process by giving children the opportunity to make whatever activity they are doing their own, and for children to develop a variety of cognitive skills by continually being stimulated and challenged (Wardle cited in Mentin 2003, p. 27).

A recent development in play equipment design (See Figure 9) is the multi-play structure which combines several of the individual pieces of equipment into one play unit. This composite approach allows for various elements to be arranged according to budget or spatial constraints. The components are usually also pre-fabricated and items can be ordered from catalogues and can be constructed on site according to a chosen plan or layout.

Figure 9: Multi-play (Monolithic) structures (Source: Anon n.d.).

Although the play-types offered could be considered as typical, the configuration of elements, scale and size introduces an element of uniqueness into each structure. Multi-play structures have the disadvantages of offering constricted play space and do not allow for the different abilities and ages of children playing simultaneously (Mentin 2003, p. 41). There are some examples of these ply-structures in public parks in Johannesburg; however they come at a premium cost. The quote given for the supply and installation of a
multi-play structure similar to the one illustrated above (to meet municipal regulations) was in excess of five hundred thousand Rand (approx. US $ 50 000 at the time of writing) (Williams 2014).

Contemporary playgrounds are individually designed by architects or landscape architects. These are usually large and expensive endeavours that display contemporary designs, sculptural quality of landforms, decorative non-functional architectural structures and purpose-designed play structures (Mentin 2003, p. 27). Often the motives of developers of such grand public spaces are beyond that of child development. The play structures or ‘play sculptures’ in contemporary playgrounds are generally designed and created according to the conceptual or aesthetic criteria of the designer or artist and often do not meet the full range of developmental needs of children. They can however promote social play in the form of retreat, quiet play and conversing (Mentin 2003, p. 28).

‘Landscape-based’ playgrounds are an attempt to offer different and varied play-types as alternatives to existing playgrounds. Research results indicated that when simple landscape elements were introduced into playgrounds, different types of development were encouraged. Landscaped elements could link cognitive understandings of space with design layout, and vegetative rooms enabled children to develop a sense of place within their play environment (Herrington & Studtmann 1998, p. 204).

CONCLUSION

The research revealed that outdoor play opportunities for children within this urban context are actually decreasing. The greatest cause appears to be from metal theft and vandalism. A significant amount of play equipment has been vandalised beyond use or has completely disappeared. This trend is likely to continue as densification of urban areas increases. The densification of ‘locationally advantaged’ areas (as mentioned in this study) is being encouraged, as this form of development comes at no capital cost to the State and relies heavily on existing infrastructure and private sector investment to address current housing demands. (Gardner 2010; Joburg East Express 2014, p. 1-3)

The reaction by the managing agent regarding these playground problems appears to be either to halt all maintenance, or relocate the playgrounds to secured areas with restricted access. Where there has been some attempt to introduce new play opportunities into some of the upgraded playgrounds they have not achieved the desired outcomes. It could therefore be deduced that the current ‘design solutions’ are excluding users and also not providing adequate benefits to the residents, thereby contributing to the social unsustainability of these POS. Traditional play equipment is also proving to be economically unsustainable due to the continuous maintenance and replacement costs. Alternative solutions for playgrounds such as multi-play structures and contemporary playgrounds are prohibitively expensive within this context.

Design criteria for alternative playground typologies in POS

Considering design as a problem-solution, a set of design criteria has been established that could inform playground designs that encompass the space-use values required within this context. These design criteria for alternative playgrounds are listed under the following themes:

Playgrounds must support child development needs more holistically, by offering:

- Greater diversity to extend the range of play-types offered.
- Age and ability-specific play opportunities.
- Opportunities for free, imaginative and dramatic play.
- Varied complexity levels and multiple challenges.
- Possibilities for ‘quiet’ and transitional spaces which are often neglected in traditional playgrounds.
- Ease of accessibility by all children onto any structures.

Playground designs must be context-specific by allowing for:

- Installation/fabrication methods which can accommodate site variations, existing vegetation and promote the use of landscaping techniques.
- Varied, enhanced and contextualised arrangement of the elements onto the site.
- The provision of facilities that are lacking in the local environment.
Playgrounds must be designed for the benefits of the residents as opposed to the managing agents through:
- Being accessible at all times.
- Truly meeting the needs of the residents.
- Countering the ‘one-size-fits-all’ mentality adopted by the authorities by offering a diversity of solutions.

The design of playgrounds must contribute towards the sustainability of POS through:
- The use of vandal-proof elements.
- Increased durability relating to the materials and finishes used.
- Using design to address the perceived ‘problems’ as opposed to enforcing ‘rules and regulations’ on the user.
- Considering the diversity of all users’ needs.
- Contributing towards creating a unique ‘sense of place’.

Be safe to use regarding:
- The choice of materials and fixing methods.
- The height of structures to prevent serious injury from falls.
- Prevention of entrapment in tight openings and injury caused by moving parts.
- Clear observation of children at play.

Conceptual development of play-block system.

Figure 10: Concept sketch of Play-Block system arrangement on site (Source: Author 2010).
The concept for this design (See Figure 10) was to develop a system of interlocking blocks that would allow for easy installation onto a variety of existing sites. The modular approach would allow for site specific and varied configuration of elements, creating a unique novelty value and sense of place at each individual site. The arrangement of elements is intended to create a play-space or environment that is conducive to promoting free and imaginative play opportunities.
The aim is to manufacture these blocks from pigmented weather resistant and vandal-proof materials. The forming process should allow for the inclusion of detailed signs and symbols that may appeal to children and have possible educational benefits. Prototypes are to be developed to investigate the possible use of either cement based or recycled plastic materials, and to determine the viability of this solution.

A similar approach to playground design could be achieved by using some of the many pre-fabricated concrete components made for building and engineering purposes. The example (See Figure 12), proposes the reuse of pre-cast concrete road barriers arranged vertically, to create a space for children to use imaginatively, which is vandal proof and maintenance-free.

These design proposals are examples of many possible alternative solutions. It is however imperative that decisions on what play opportunities to provide for children should be based on a thorough understanding of all existing and lacking facilities in their local environment (Naylor 1985, p. 124). Equally, design decisions
about physical space should be evidence-based (Whitemyer 2010). Design solutions must be tested within the specific context for which they are intended. Ultimately it should be “the children’s judgement alone which decides whether play equipment [and playgrounds in POS] are ‘good’ or not, as they are the definitive users” (Naylor 1985, p.123). Although there is paucity of design research to support the technological dimensions of play, research of this kind should become an essential starting point for future design development and implementation.

REFERENCES


Johannesburg East Express, 2014. ‘Accommodation plans slammed’, 29 April, pp. 1-3


STUDY OF GUIDELINES OF DARMO CORRIDOR SURABAYA AS A FLEXIBLE SPACE DURING CAR FREE DAY PROGRAM

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Abstract

In 2009, the municipality of Surabaya initiated a Car Free Day program every Sunday morning at Darmo corridor to provide the needs of public spaces, which increased significantly following its population increase. People are invited to occupy space in the corridor by doing various activities, later forming a public space in the corridor. Since public involvement in this program is increasing, the corridor is getting crowded, and thus, people’s satisfaction reduces. The purpose of this study is to prevent the comfort level of Darmo corridor from decreasing to encourage people's engagement in the public space. We would manipulate the activity zones, then deliver alternatives that would be analyzed through an Analytical Hierarchy Process (AHP) method. The product of this study includes the guidelines to manage Darmo corridor to become more comfortable. Furthermore, the corridor will be able to be a comfortable flexible public space by applying the guidelines.

Keywords: car free day, public activities, public space.

INTRODUCTION

Nowadays, the development of cities is rapid. Surabaya, as the second biggest city in Indonesia, had reached a population of 3,110,187 by 2012. The need for public space is increasing, while the availability of the green open space is limited accounting for only 0.5% and far less from the government requirement of 20% of the total area. Therefore, in 2009, the municipality of Surabaya initiated a Car Free Day program every Sunday from 6 a.m. to 10 a.m. in Darmo corridor, since constructing a public space to answer the needs of public spaces is difficult.

People are invited to occupy space in the corridor by doing various activities such as, running, cycling, having picnics, exhibiting hobbies, promoting companies, etc, later forming a public space in the corridor. Since 2010, the numbers of unorganized activities increased as the enthusiasm was shown by the intention to get involved in the limited space. The corridor shifts into an overcrowded public space during the program and delivers an uncomfortable space. In dealing with the problem, the municipality of Surabaya created another Car Free Day program in Kertajaya corridor in 2011 to distribute the load in Darmo corridor, so that the corridor would be a more comfortable public space.

Figure 1: Car Free Day area at Darmo corridor

However, we doubt that the strategy was sufficient in improving the comfort of the corridor. Considering the lack of the current government’s intervention, and the need to encourage society to use public spaces by increasing physical and psychological comfort, we posit that Darmo corridor needs to be managed immediately. We admit that managing public space must be comprehensive and cannot be assumed to be taking place from only one point of view.
PUBLIC SPACES: LITERATURE AND FACTS

Public space is defined as people oriented spaces and designed based on what people need, so that the space is able to accommodate public activities. It is an area where everyone could engage in individual or communal activity, and everyone has rights to use public space without being discriminated because of social or economic condition (Carr 1992). Furthermore, city development and its space limitations have to be considered in developing public space. Shared Street is introduced as an approach by looking at a street as a physical and psychological part of its neighborhood, and used simultaneously for vehicle, community activities, and social contact (Southworth 1996). This approach integrates pedestrians, vehicle movement, and public activities in the same area. There are Shared Street design characteristics, such as; part of housing/settlement or public area, having traffic separators; prioritizing pedestrians; clear entrance; having direct access to residences; and equipped with street furniture & urban elements.

Pursuing public space through a shared street approach has been done during a Car Free Day program implemented in Jakarta. Held along Thamrin and Sudirman Street, this program attracts people to get involved because it’s located in the most iconic area in Jakarta, Bundaran Hotel Indonesia (Indonesia Hotel Roundabout). Various activities are held over a wide scale, from small to big scale, including permitting Trans Jakarta (bus, public transportation) to operate in the corridor during the program. It gives a big impact in structuring the public space. Activities on a big scale are held in a determined location, to avoid accidents, since a lot of people are involved. Other activities will follow in a flexible way, yet deliver an overcrowded public space. Another example in Malang, they already have a city square functioning as a public space. Designed to accommodate people’s needs, this square is equipped with urban and landscape elements. This space is not only used for sports, exhibitions, concerts, or carnivals, but also enjoying the ambience of the place. Considering the local culture of hawker food, some spaces for selling food & beverages are provided so that it won’t disturb other activities.

Based on those reviews, we agree that the social context should be regarded in the comprehensive approach besides its shared street & public space criteria.

METHODS

A qualitative descriptive analysis method was used in this study. We looked at various activities in Darmo corridor as the social context. It was taken by observing the corridor during the Car Free Day periodically to investigate the variety of held activities (see Table 2). The result was inventorised, and later would have been manipulated to carry out the zone of activities. A literatures review about public spaces and shared streets has been synthesized and adjusted with the context of the corridor as a public space (see Table 3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Parameter</th>
<th>Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_1 ): the activities</td>
<td>Held activities at the corridor during the Car Free Day program.</td>
<td>Zone of activities</td>
<td>Exploration: manipulating the zone to get alternatives.</td>
</tr>
<tr>
<td>( Y_1 ): the criteria</td>
<td>People oriented spaces, designed based on what people need, and able to accommodate public activities (Carr 1992).</td>
<td>Public space criteria</td>
<td>Literature: analyzing literature to be synthesized into the context of study.</td>
</tr>
</tbody>
</table>

Table 1. The variables and descriptions

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Picture</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

Table 2. Inventory of activities
1. Promotion Stand
Promoting goods or services. Using flooring elements, and roofing elements for a big scale.

2. Trading
Selling street snacks, antique goods, clothes, toys, etc. Some sellers are moving by bicycle or food truck, others are staying in one spot.

3. Children’s area
Renting toys to accommodate families coming with children.

4. Field Sport
These are sports which occupy a space, as a sport field, and stay on their sport field.

5. Moving Sport
These sports move around the public space, such as: running, in-line skating, cycling, et cetera.

6. Community
Self-existance is the aim of the community activities. They occupy space to exhibit their interest.

Table 3. Public space criteria to be achieved

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Safety</td>
<td>Users’ safety while using the space</td>
</tr>
<tr>
<td>2.</td>
<td>Orientation</td>
<td>Clear orientation of zone and circulation</td>
</tr>
<tr>
<td>3.</td>
<td>Psychological comfort</td>
<td>Engagement with the space and other people</td>
</tr>
<tr>
<td>4.</td>
<td>Physical comfort</td>
<td>Thermal comfort, glare, shadow, urban elements</td>
</tr>
</tbody>
</table>

Analytic Hierarchy Process
The activities zone manipulation delivers 3 alternatives. Those were analyzed through an Analytic Hierarchy Process. Analytic Hierarchy Process (AHP) is a method that helps to get the ratio of qualitative data, such as opinion, feeling, behavior, and trust. Using AHP, we started with structuring the hierarchy of the research question or hypothesis. The hierarchy includes the purpose that wants to be achieved, criteria, sub-criteria (if
AHP was used to analyze the result of alternative zones. Figure 2 shows the hierarchy process structure in this study. Level 3 is the alternative solutions for the study purpose (Level 1) by considering criteria at the second level.

**Figure 2: Analytic Hierarchy Process.**

Relative measurement scale would be used to avoid subjectivity in scoring the alternatives. This scale made a relative and interest-based decision into absolute score.

<table>
<thead>
<tr>
<th>Interest in absolute scale</th>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equally important</td>
<td>Both activities would aim the purpose</td>
</tr>
<tr>
<td>3</td>
<td>One is more important than others</td>
<td>Decision shows a few interest on one activity than others</td>
</tr>
<tr>
<td>5</td>
<td>Important</td>
<td>Decision shows interest on one activity than others</td>
</tr>
<tr>
<td>7</td>
<td>Very important</td>
<td>Decision shows stronger interest on one activity than others</td>
</tr>
<tr>
<td>9</td>
<td>Highly important</td>
<td>Decision shows the strongest interest in one activity</td>
</tr>
<tr>
<td>2, 4, 6, &amp; 8</td>
<td>In between decision value which is similar</td>
<td>In case compromised is needed</td>
</tr>
</tbody>
</table>

**RESULTS**

The result is the most feasible activities zone as a guideline for the Car Free Day program at Darmo corridor (see Figure 3).
In this alternative, separated activities based on the velocity would increase the safety factor. Moving sports area (blue) should be located on the west lane of the corridor and separated by the boulevard with community (brown), promotion stand (orange), trading area (yellow), and children’s area (pink). Accidents caused by high velocity activity could be avoided, especially for children. The children’s area should be located in front of the Bungkul Park (green), as the park is the main landmark and entrance to the corridor. The trading area may be located on both sides of the children’s area to support children's activities, such as renting toys, selling foods, or goods. The field sports (purple) should be located on the edges of the corridor, so that they won't be disturbed by circulation of others. Moreover, field sports and moving sports could be integrated and make a smooth transition of space. A community and promotion area should be located together next to the trading area. Those two areas mostly have the same activities: exhibiting their interests. By locating them in the same area, the ambience and public engagement in the area would increase because of the crowds. The equipment would be easily organized in the same area. This relates to psychological & physical comfort in the public space. By managing the activities zone, spatial orientation would be clearer, the safety issues, and psychological & physical comfort could be achieved.

**DISCUSSION**

The analyzed alternatives using the Analytical Hierarchy Process with 4 criteria from the literatures and case study review delivers the activities zone that should be, as shown in Figure 3. In general, this study meets its purpose, as public space criteria are achieved. Considering velocity as the main issue to deliver a proper result can increase the comfort level in the corridor during the program. The activities zone will bear a clear orientation, spare the crowdedness, and then prevent the result of an uncomfortable Darmo corridor as a public space, where people’s engagement might decrease because of discomfort. Moreover, urban elements are needed to support the safety, orientation, and comfort in having public activities in this shifting corridor, such as; signage, utility, and landscape elements.

However, there is some critical review of this study. In dealing with social impacts, the results are too rigid to be implemented directly. There will be a grey zone where some activities are mixed in the area, which is not a problem because the phenomenon is part of social agreement. We realize that limiting the flexibility of the space will stimulate people to ignore the activities zone then repeat an uncomfortable space. Therefore, wider public engagement has to be considered to gain depth, with the context for further study. This may include current programs, authorized parties and residents of the corridor in making guidelines, instead of
hard-coding the activities, then delivering a less contextual result. In fact, getting deep into the process of place making in this corridor would be very interesting so that it increases the quality of the study.

CONCLUSION

We posit that the result of this study will generate Darmo corridor into a comfortable public space and provide lessons for further study. Future research of this particular corridor needs to examine the present condition of the program and its context, so that it could increase the richness of the case. Finally, by looking at normative treatment in the criteria and making alternatives may also improve the AHP model.

ACKNOWLEDGEMENTS

This research is supported by Department of Architecture, Sepuluh Nopember Institute of Technology, Indonesia.

REFERENCES


Your reviewer comments are as follows:

Reviewer 1: Content and structure This document seems like something that could be used to assess an internal urban governance and decision making process, but its relevance to the external reader remains unclear. There are also a number of methodological aspects which seem questionable. For example, why are X1 and Y1 variables being introduced, while they are not needed later on? The author seems to assume that the reader can (and wants to) follow descriptions using terms such as “in front of Bungkul Park, “on both sides of the children’s area” etc., while the described design decisions are not explained anywhere (for example, why should a trading area be located on both sides of children area? To some readers this might seem not a good idea.). It must be remarked that recommendations from abstract review were not taken into account. Writing style and conclusion The meaning of the paper for an unrelated reader is not clear, and is not put into perspective by the author.

Reviewer 2: Interesting, though technocratic; the limitations of the study are however acknowledged. Some English grammar and language editing will be required.

Additional comments from the Editors: This paper is accepted for publication and presentation. However, the comments of the reviewers must be addressed thoroughly in the submission of the print-ready version of the paper. The language needs to be addressed as it is currently very poor. The format and referencing must strictly adhere to the UIA 2014 Durban prescribed format. The concerns of the second reviewer must also be considered.
AN ARCHITECTURE FOR MARGINALISED SOUTH AFRICANS: THE ROLE OF EDUCATION

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Abstract

The quality of architecture in economically and socially disadvantaged communities of South Africa is poor. Schools of architecture are partly to blame, for implementing a curriculum and pedagogy that do not address students’ general lack of understanding of such inequalities. The first part of this paper addresses the predominant architectural design theories implemented within schools: Beaux-Arts, Modernism, Post-modernism and to some extent Neo-modernism. An analysis of these, in relation to the needs of socially and economically disadvantaged communities, indicates that they do not meet the challenges posed by the on-going struggles of marginalised communities. The second part of the paper investigates examples of community-based student projects in an attempt to explain the influence of these theories on the pedagogy and curriculum on individual schools. To develop a South African educational model, critical thinking and cross-disciplinary research are proposed as a way of achieving a critical pedagogy; thereby enabling architecture students to address the inequalities between advantaged and marginalised communities in South Africa.

Keywords: community architecture, South Africa, architectural education theory, critical thinking.

INTRODUCTION

Few would deny that the quality of architecture in the historically socially and economically disadvantaged communities of South Africa is poor. A review of two influential books on South African architecture since the ‘dawn of democracy’ in 1994, illustrates this imbalance in architectural quality and quantity. In Joubert’s (2009) publication on 100 prominent buildings of the first decade after 1994, only one fifth are located within disadvantaged communities. Deckler, Graupner and Rasmuss’s (2006) monograph on architecture in a South African landscape of transition, found seven projects based within poor communities worthy of mention out of 36. These findings encapsulate the problem, because as Saidi (2005, p. 1) points out, “through architecture a society reveals in a visual manner its values, aspirations, beliefs and its cultural composition”. The values reflected in these two publications indicate that South African schools of architecture must systematically review the way in which students learn about the architectural needs of all South Africans. Such complex and deep-seated inequalities can only be remedied through systematic intervention.

The first part of this paper reviews the major theories that have influenced worldwide architectural education. First, influences on pedagogy and the curriculum are reviewed. After making the case for a closer relationship between academia and the broader community, the educational models of the Beaux-Arts, Modernist, and Post-modernist eras are discussed in terms of their response to the needs of the users of the built environment. A brief overview of post Post-modernist theories follows.

The second part of the paper investigates the influence of architectural education on the quality of life in marginalised communities, by means of three case studies of community-based student projects. Finally, critical thinking is proposed as a new epistemological approach for South African architectural education: one that may result in a built environment that meets the challenges posed by the on-going struggles of marginalised communities.

AN ARCHITECTURE FOR MARGINALISED SOUTH AFRICANS

Resolving the socio-economic crisis in South Africa, requires the urgent provision of quality housing and community service buildings. Spector (2011, p. 30) observes a “disturbing shift” in the ability of architecture to balance that which is authentic and real, with what is not. As a result students still believe that ‘architecture’ is a new building on an empty piece of land (Parker 2013) or worse, a computer rendered design concept within a customised context. Buchanan (2012) blames this on tutors who believe that rigorous preparation for the pragmatic requirements of practice, compromises students’ creative freedom. Despite many opportunities for combining studio-based exercises with “almost anthropological immersion
... in the site as a social milieu” (Parker 2013), Buchanan (2012) accuses these tutors of setting increasingly irrelevant projects.

Instead of paying lip service to ‘architecture for the poor’, tutors should inspire students to find site-specific ways of seeing (Parker 2013), thereby enabling them to meaningfully address the needs of the disadvantaged. Built objects, argues Murray (in Deckler et al. 2006) are presented as iconic objects instead of in terms of their socio-cultural and economic impact. The profession consistently holds up a meagre collection of architectural icons in architecturally underserved areas, such as the Red Location Museum (Noero Wolff Architects, New Brighton, Port Elizabeth 2011); the Hector Pieterson Memorial (Mashabane Rose Architects, Orlando West, Soweto 2002) or the Soweto Theatre (Chibwe Afritects, Jabulani, Soweto 2012). These “acupuncture points” (sharpCITY, in Deckler et al. 2006, p. 1) are presented as a solution to these shortcomings, rather than to emphasise the dearth of meaningful architecture in less visible communities.

Unless we enrich our academic discourse by crossing disciplinary boundaries, we cannot resolve the “complexities of practice at the margins” (Murray, in Deckler et al. 2006) of the current South African architectural landscape.

Levels of change
To meaningfully change the outcomes of South African architectural education, the system itself must be changed. The following analysis at the levels of pedagogy, curriculum, and epistemology may reveal those changes that are necessary and possible:

Pedagogical change - teaching what we always did, but in a different way - would arguably be the easiest, but certainly the least significant change.

At a more complex level, we can reconsider what we teach and change the curriculum. To make a significant impact, curricular change has to be addressed on levels that almost inevitably lead to bureaucratic entanglement, with resultant timidity on the side of tutors and staleness in the eventual outcome (Colomina, Choi, Gonzalez Galan & Meister 2012).

The most difficult, but most effective intervention is epistemological change: aligning the philosophies underlying South African architectural education with the socio-political transition of the South African community.

Saidi (2005) asks three important questions: 1) who should determine the curriculum; 2) how are content decisions made; and 3) why should some things be taught, and others not? Countries and schools develop a pedagogy that, as Saidi (p. 3) puts it, “is specific to their kind of society”. Educational systems however are subject to many external influences, for example the requirements of international accreditation bodies, local geographic and social realities, and the needs of individual students. The demands of international accreditation bodies are based on a presupposed definition of architecture (Sunwoo 2012). Imposing a definition that is out of phase with the local architectural, intellectual or cultural milieu, may require radical adjustments (Saidi 2005) and ultimately result in an obsolete curriculum.

User-needs focused education
The argument presented in this paper assumes that the ultimate product of architectural education is a built environment that fulfils the needs of its users. Determining the identity of the client of the education process is less clear-cut.

Let us consider two enduring educational models. The Bauhaus (1919 – 1933) responded to a need for change from an architectural education of “historical art form and an entrenched academism that seemed bereft of contemporary significance” to “discover[ing the] means of expression that reflected the Zeitgeist” (Barnstone 2008, p. 48). The Bauhaus model in particular emphasised that art stood in the service of industry. By the end of the 1960s, student projects at the Bauhaus-inspired Illinois Institute of Technology (IIT) were intentionally experimental and unpredictable, but also “potentially more relevant for an expanding field and the culture it saw itself serving” (Salomon 2012, p. 37).
The Architectural Association (AA) in London has a similarly clear conception of its client, having "reclaimed a role for the school of architecture as the crux of architectural culture and the site of disciplinary reinvention" (Sunwoo 2012, p. 38). Whereas the Bauhaus model serves the industry, the AA serves the profession.

Westfall (2011) explains Hegel’s concept of Zeitgeist in relation to architecture: ‘Geist’ refers to the unique influences on a specific ‘Zeit’, or time. Some believe that combining this concept with French philosopher August Comte’s (1798 – 1857) theories on how physical scientists use qualitative methods to understand the role of man in society, helps us understand how changes in artistic style indicate social change. It can therefore be argued that by understanding the Zeitgeist, we can understand changes in social progress. If, as Spector (2011) believes, the Zeitgeist of an era both permits and requires a particular approach to architecture, this raises the question: what is the Zeitgeist reflected by the outcomes of South African architectural education?

A sustainable architectural curriculum is one that benefits all of society, and can only last and evolve as long as it is aligned with its context (Saidi 2005). Yet, almost 100 years after the formation of the Bauhaus, many graduates are still poorly prepared for entering an unfamiliar, changing professional environment (ibid.) and as a result deliver a less than satisfactory service to the majority of South Africans (Deckler et al. 2006; Saidi 2005). South African students need to be prepared for the realities of practice in an environment where, as Fisher (in Deckler et al. 2006, p. 3) observes, “the graveyards [are] the fastest growing part of the landscape, after the houses”. Preparing students to successfully practice in this design environment is arguably the primary task of schools, for as Saidi (2005, p. 6) remarks “[t]he way a learner is trained ... has an influence on the kinds of problems they consider important in the built environment”. In other words, our pedagogy and our curriculum illustrate the Zeitgeist of South African architectural education.

THE MAJOR ERAS OF ARCHITECTURAL EDUCATION

Architectural education has historically been influenced by three prevalent design theories. In the late 1800s, the Beaux-Arts (Fine Arts) movement led to the creation of the École des Beaux-Arts (1648 – 1968); the Bauhaus (1919 – 1933) arose from the Modern Movement and its Modernist curriculum influenced architectural education until the late 1960s; Post-Modernism led to widespread and radical curriculum changes in the 1970s. The on-going reintroduction of many of the formalistic components of Modernism under Neo-Modernist education is a reaction to what Rem Koolhaas calls the “nightmare of [Post-Modern] semantics” (Salomon 2012, p. 39).

Following is an overview of the history of architectural education, with specific attention to integration of knowledge and an understanding and respect for the real world.

The ‘École des Beaux-Arts’, the first formal school of architecture, was opened in France in 1743. The Beaux-Arts model became synonymous with French architectural education until 1968 (Moffett, Fazio & Wodehouse 2003; Sadler 2008), and continued in England and the USA into the 1930s. Remnants of the Beaux-Arts pedagogy still remain today, notably the atelier with its patron, or tutor/studio master. Beaux-Arts era students were not required to interact with the built environment. Even for their final examination before entering the profession, they were all given the same site and problem (Salomon 2011). The “stiffly formal” (Sadler 2008) École model disregarded technology and technological advances, but instead clung to a conservative curriculum based on classical architecture (Moffett et al. 2003).

When tutors uncritically repeat the method in which they were taught without adapting to the needs of student cohorts, student dissatisfaction is inevitable. This is exactly what led to the final demise of the Beaux-Arts educational model in the late 1960s. In Paris in 1968, École students famously accused its curriculum of being non-responsive to contemporary social and political problems and demanded that it be changed to reflect their views for a changed social environment.

Long before the final demise of the Beaux-Arts epoch, Walter Gropius in 1919 established the icon of Modernist schools of architecture, the Bauhaus. Sadler (2008) believes that the difference between the Beaux-Arts and Modernist movements lay not in their pedagogy, but rather in their interpretation of the principles of function, context and structural rationality. The Bauhaus curriculum encouraged students to
experiment with, and implement the new materials and technologies that became available after WWII. By the height of the Modernist era student projects were responding to post-war needs for housing, schools and hospitals, and urban redevelopment (Sunwoo 2012). In response to a demand for greater attention to site selection and programming (Salomon 2011), students by then were also selecting their own sites and independently resolving their identified problems.

In contrast to its technological experimentation, Modernist urban design principles demanded rigid, functional zoning of cities and housing. Tenants were infamously contained in high-density tower blocks, separated both by, and from landscaped spaces (Sadler 2008). By the late 1960s as Beaux-Arts students and staff revolted against the “class segregation perpetuated and augmented by present bourgeois urbanism” (ibid, p. 46), a growing concern about the type of housing estates that thrived under Modernism introduced cross-disciplinary investigation into the anthropological and social content of student projects (Salomon 2012).

Once the Avant-Garde artefacts of the Modern Movement became academically institutionalised and architecturally commonplace Modernism, its original supporters challenged its relevance. The way for Post-modernism was paved. The long-standing and rigid framework of contemporary Modernist architectural education, Saidi (2005) believes, causes insularity and resistance to change. Some therefore believe that architectural practice in South Africa must reposition itself away from the influences of Modernity, towards a “better fit within the Post-modern, globalising world of hyperreality” (Murray in Deckler et al, 2006, p. 4).

Post-modernist theory "embraces the concepts of affectiveness, problems, emotions and uncertainty, which ... characterize the South African society” (Saidi 2005, p. 173). Its flexibility and ability to be modified, Saidi argues, encourage more fluidity around subject content, project delineation, and classroom management. Exploration of concepts, content, and methodologies across disciplinary boundaries are therefore expected. In this way, Post-modernist learning becomes co-operative, interpretive, and individualised, so that differences in race, gender, and even learning styles, are valued as resources and not reviled as obstacles.

Sunwoo (2012, p. 24) considers education as “one of architectural postmodernism’s most productive arenas”. The Modernist model was spread across the globe by educators schooled at the Bauhaus; similarly the ‘radical’ beliefs of “neo-avant-garde intrigue” (Sadler 2008, p. 44) at schools such as the AA was spread through visiting scholarships by its graduates (e.g. Zaha Hadid, Rem Koolhaas, and Bernard Tschumi).

Despite its attempt to correct the shortcomings of Modernism (Joubert 2009), Post-modernism is not problem-free. While Saidi (2005, p. 176) believes that a particular strength of post-modern pedagogy is that encouraging critical thinking skills in learners enables them to become practitioners who “examine the values that underlie their ethics and guide their actions”, Spector (2011, p. 24) warns that it leaves behind the formal and clear progression from “necessary beginning points [and] convergence toward important ends” of the Modernist curriculum.

Without clear guidelines, it is all too easy for schools “to follow the profession into producing the unruly undergrowth that follows clear-cutting and the anarchy that is inevitable following liberation from tyranny” (Westfall 2011, p. 151). Hassan (2003, p. 303) makes no bones about the issues around Post-modernism: “we hardly know what postmodernism (sic) was”. For such a lack of theoretical clarity to blur the boundaries between pedagogical freedom and curricular chaos is no great leap, and is arguably part of what has led to some of the shortcomings of South African architectural education.

There is lively debate amongst theorists about the on-going relevance of Post-modernism. Sunwoo (2012) attempts to understand whether Post-modern education is still relevant or on the brink of extensive changes by analysing extensive changes to the AA’s curriculum in 1973. Kirby (2010) makes the salient point that “postmodernism has been declared dead for as long as it has been alive”.

Spector (2011) believes that Neo-modernism - which he himself refers to as “modernism lite” (p. 25) - may be the next major theoretical influence on architecture. Neo-modernism (or Super-Modernism) reflects the influence of computers on design through the pushing of structural and gravitational boundaries (Joubert 2009) and supports students’ ability to express their individuality - but lacks a will to improve the qualities of the built environment. Such a “void in values” (Spector 2011, p. 25) is clearly out of phase with the
requirements of contemporary South African society. Neo-modernism is therefore unsuitable as an epistemological base for architectural education in South Africa.

Hassan’s (2003) observation, that no one knows what lies beyond Post-modernism, illustrates the problem: there is no evidence of a suitable architectural theory to take the place of Post-modernism’s role (such as it was) in guiding architectural education.

Modernist and Post-modernist models are still implemented in many schools but despite the waning popularity of their underlying theories, uncritical acceptance of alternative ‘solutions’ would be unwise. Saidi (2005) describes the contemporary Modernist curriculum as one with its purposes, experiences, methods and assessments arranged in a logical and sequential way. Sunwoo (2012, p. 24) believes that the Post-modern-inspired move towards intellectual and critical practice in the 1960s came at the loss of Modernism’s “realistic” approach to architectural education. Table 1 compares the characteristics of Beaux-Arts, Modernist and Post-modernist education.

Table 1: Major theoretical influences on architectural education

<table>
<thead>
<tr>
<th>Model/theory</th>
<th>Pedagogical strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaux-Arts</td>
<td>• Formalised the architectural curriculum and pedagogy</td>
<td>• Detached or complacent reflection, the “lone genius”</td>
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<tr>
<td></td>
<td></td>
<td>• Conservative curriculum</td>
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<td></td>
<td></td>
<td>• Separation of program and structure</td>
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<td></td>
<td></td>
<td>• The disregard of technical innovation</td>
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<tr>
<td>Modernism</td>
<td>• Logical and sequential</td>
<td>• Traditionalism and insularity: graduates not prepared for societal change</td>
</tr>
<tr>
<td></td>
<td>• Fewer barriers between aesthetics, technology and society</td>
<td>• Tendency toward formalistic functionality and formulaic solutions</td>
</tr>
<tr>
<td></td>
<td>• Relatively dynamic, intuitive, scientific, creative training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sense of civic responsibility</td>
<td></td>
</tr>
<tr>
<td>Post-Modernism</td>
<td>• Supports critical thinking: suitable for societies in transformation</td>
<td>• Focus on the semantic rather than on pragmatism</td>
</tr>
<tr>
<td></td>
<td>• Acts as social, political and economic change agent</td>
<td>• Theoretically poorly defined</td>
</tr>
<tr>
<td></td>
<td>• Eclectic exploration of cross-disciplinary methodologies: leads to disciplinary self-questioning</td>
<td></td>
</tr>
<tr>
<td>Neo-modernism</td>
<td>• Supports students’ ability to express their individuality</td>
<td>• Does not fit with the requirements of community-oriented architecture</td>
</tr>
<tr>
<td></td>
<td>• Exploration of boundaries</td>
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THE STUDIO AND THE COMMUNITY

The South African architectural education model

South African qualifications in architecture can be achieved through accredited courses at universities, or universities of technology. University courses are structured in two parts: 1) a three year Bachelor’s degree and 2) an additional two-year professional degree, the M Arch (prof). Universities of Technology offer a three year National Diploma, with an additional year of study leading to a BTech (Architecture). A two-year Master’s degree in Technology (MTech) is also offered at some universities of technology. The accrediting body is the South African Council for the Architectural Profession (SACAP), with international accreditation by the Commonwealth Association of Architects (CAA).

As a former colony, South Africa inherited the Beaux-Arts, and Modernist/Bauhaus models of education. Based on traditional, discipline based knowledge, the resulting curricula are typically “well thought out,
planned and almost simplistic” (Saidi 2005, p. 77). It is not surprising then, that Deckler et al. (2006) now ask how South African architectural practice can move away from its typically modernist approach (closed, absolute and over determined), to one that is more objective in its views. The answer may lie in Kruss et al.’s (2012, p. 6) hope for “a more comprehensive, holistic and developmental vision” in the way in which universities engage with the wider society. Unfortunately for South African society, Saidi (2005) found that even well after the millennium, the curricula of most schools still served the wealthy and powerful, and that addressing the problems of the poor did not form any significant part of their goals.

Deckler et al. (2006) found that at both professional and academic level, issues of social agency, race and ethnicity are often superficially lumped together under the concept of ‘humanism’. When students become used to avoiding “messy contact” (ibid.) with the problems for which they are developing architectural solutions, as professionals they will tend to continue with this approach to community design.

Despite growing interest, there is as yet little empirical research on pedagogical approaches in South African architectural education, making it difficult to analyse the reasons for both successful and unsuccessful attempts at interaction (not merely theoretical interventions) in South Africa. Kruss et al. (2012, p. 6) are developing a framework for research on relationships between “knowledge producers and users” which may prove useful for this purpose.

**Community-based architectural student projects**

There are precedents for community-service projects in schools of architecture that resulted in significant advantages for the communities in which they were based. Three case studies as presented: one international (the Rural Studio), and two South African community-based projects which the author was involved with at the University of Johannesburg in 2012 and at the University of the Free State in 2013.

Arguably the best known of all community based student projects is the Rural Studio program founded 20 years ago by DK Ruth and Samuel Mockbee at Auburn University, Alabama. The Rural Studio philosophy is that everyone, rich or poor, deserves the benefit of good design (Rural Studio 2014). Students work with impoverished communities in West Alabama and together with their ‘clients’, they define solutions, fundraise, design and build their projects. The program requires students to examine their selected site in terms of its social characteristics, and in particular the impact of the poverty of the community on their living conditions (Salomon 2011). Students do a compulsory project during their undergraduate studies, and selected students are permitted in their final year to partake in a group thesis project, where they propose, design, develop and build a project in the same community.

The Department of Architecture at the University of Johannesburg (UJ) believes that transformation of the urban built environment cannot take place unless architects are skilled in participative planning (Parker 2013). In true Post-modernist style, students are encouraged to develop schemes rooted in context (Barac 2013). Alexander Opper, convener of the masters’ program believes that “[y]ou have to ask what else is possible outside the norm – the so-called norm, because informal settlement is becoming the norm” (Parker 2013).

The intervention described here is part of the on-going ‘Informal Studio’, an in-situ urban upgrade project. In this case, the intervention was based in Marlboro South, an impoverished informal (and nominally illegal) community situated within five kilometres of Sandton, arguably Africa’s wealthiest precinct. What started as a request by master’s students for third year students’ help on a ‘real life’ Urban Design project, became a seven-week immersive academic and personal experience.

Third year student groups were required to present two schemes: a solution for an immediate problem; and a medium term proposal for the upgrading of residents’ temporary living units. The master’s students focused primarily on a medium- to long term urban intervention. Within the first week, police and private security companies raided Marlboro South and evicted scores of households. In the following weeks another community housing building burned down, and a once-in-a-decade snowfall caused great misery. Despite (or probably because of) these setbacks, and initial reservations amongst community members, the students formed an emotional bond with the residents of Marlboro South. One reason for the success of the project is that community members acted as co-researchers (Parker 2013), and rather than designing for them, students worked with residents to redesign their living spaces.
This ad-hoc project could have resulted in problems around assessment and outcomes in a school with a less Post-modernist educational model. Third year tutors had to re-organise their programs and completely re-think the assessment process at short notice and students had to perform under much pressure and with little formal structure. Intermediate critiques were pinned up on walls in Marlboro South, and created much interest amongst residents; community members travelled to the school to take part in discussions and attend the final presentations. Artefacts presented for academic assessment included in-use installations, personal anecdotes, photos, videos, computer models, prototypes, models and drawings.

Despite the problems described here, students (and tutors) found that the project positively affected the way they think about architecture (Mabandu 2013), making it very much worthwhile. Arguably the greatest achievement that came out of this project is that a process map created by tutors Eric Wright and Claudia Delgado became the basis for discussion between architects and the City about collaboration around the challenges addressed by the Informal Studio (le Roux 2013).

In contrast to the Post-modern approach to education at the University of Johannesburg’s Department of Architecture, the curriculum and pedagogy of the Department of Architecture at the University of the Free State (UFS) is firmly rooted in Regional Modernism. The curriculum refers heavily to Critical Regionalism, and the preservation of the vernacular architecture of the Free State and Karoo regions forms the basis of many projects. The goal of the Department’s honours course is “for students to come to terms with the art of townscape - the merging of history, topography, geography and the built environment - the context for most commissions in architecture” (Peters & du Preez 2013, p. 5).

As part of the annual ‘Conservation’ project, students in 2013 mapped and documented the remains of many of the buildings that were demolished in the town of Richmond. The purpose of the demolitions was to give spatial definition to the requirements of the South African Group Areas Act, 1950 (ibid.). A book on the research created through the project, was published by the Department to raise the awareness of all South Africans of the impact such legislation had on certain population groups.

All three these initiatives, the Rural Studio at Auburn, the Informal Studio at the University of Johannesburg, and the Richmond Conservation project at UFS, illustrate how curriculum and pedagogy can make a significant contribution to sensitising architecture students to the hardships created in poor communities through insensitive planning and design.

**CRITICAL THINKING ABOUT ARCHITECTURAL EDUCATION**

The foregoing analysis of the poor quality of South African community architecture points a finger at the quality of its architectural education. The architectural profession should seek a “new sense of cultural identity and cultural confidence” (sharpCITY in Deckler et al. 2006, p. 1) to enable it to create the architectural interventions that may rebalance some of the inequalities between the built environments of the wealthy and the marginalised. Schools in turn should break away from “academic abstraction and obsessive search for novelty and technical profession” (ibid.).

The analysis of the theories of Beaux-Arts, Modernism, Post-modernism and even Neo-modernism indicates their influence on, and the overall format of, architectural education. It has also become clear that they are not entirely suitable as an epistemological basis for decisions about pedagogy or the curriculum. The cross-disciplinary research that forms part of Modernist- and Post-modernist design must now be applied to architectural education. Theories such as Situated Learning developed by education specialists, or even management theories such as Complexity Theory, may well prove to be a solution to some of the shortcomings of the South African architectural education model.

Critical thinking - the identification of faulty and unreliable assertions or meanings (Saidi 2005) - is proposed as a possible vehicle of change. Critical thinking has long been “a valuable part of the architect’s kit” (Westfall 2011, p. 149) and can help to merge architectural and humanitarian thinking. As a result, critical thinking can create the critical pedagogy required to “transform oppressive institutions or social relations” (Saidi 2005, p. 176). Good teaching is after all, the educational equivalent of good design (Little and Cardenas 2001, Buchanan 2011).
REFERENCES


Joubert, O., (ed.) 2009. 100 years + 100 buildings, Bell-Roberts, Cape Town.


PHYSICAL, SOCIAL AND ECONOMIC SUSTAINABILITY THROUGH MALTEPE-BAŞİBÜYÜK DEVELOPING AXIS IN THE TRANSFORMING CITY OF ISTANBUL

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Abstract

In parallel to worldwide urban processes, 1980s Turkey and the city of Istanbul showed rapid development and renewal implementations, which take place both formal or informally. Today, Istanbul is a city of specialized quarters with business, culture, tourism and housing whereas the city faces the loss of identity, change in its pattern, fragmentation in social and physical texture and as well as a shift in its local inhabitants. The role of the city is redefined within the globalization process and the urbanization of the city clearly shows a variety of invisible borders between societies, settlements and economies.

This paper focuses on a developing axis of Istanbul where social and physical fragmentation is visible in its formally and informally built texture. Maltepe-Başibüyük axis, at the Asian side of the city is a vertical section from the Marmara Sea towards the forest area in the North and composes former modernist settlements of 60s, informal settlements of the 50s to 80s, informally constructed housing cooperatives mostly for low and middle classes, besides the public and private sector's housing complexes for the high income groups.

The aim of this research is to define a development tool for a sustainable and humane living environment in rapidly transforming mega cities such as Istanbul, where urban settlements are being regenerated regardless of their local, cultural, historical and physical potential. Through detailed analysis, mapping and evaluation, this research will overlay cultural, social, economic, physical and environmental fragmentation processes among the axis. By the use of its potential, this research targets an alternative sustainable development tool for the area, define a second choice and a different vision of urban upgrading model of similarly transforming and fragmenting areas of the city and the region.

Keywords: urban transformation, urban fragments, Maltepe- Başibüyük axis, İstanbul.

INTRODUCTION

This paper focuses on a developing axis of Asian Istanbul, where social and physical fragmentations are clearly visible among its formally and informally built urban texture. After a brief urban development history of the city, an on-site urban and social fragmentation phase will be clarified through a time line. Through this type of re-reading of the city, the aim of this paper is to overlay the social, political and spatial differentiations within a rapidly developing and transforming urban section, whilst creating an evaluation and a future expectation for similar case situations of the city.

A BRIEF HISTORY OF THE URBAN DEVELOPMENT OF THE CITY OF ISTANBUL

Cities have always been undergoing transformation for an upgraded urban image and spatial quality. Today’s changes in social and spatial needs, technology, urban texture, life quality and economy are creating push forces for higher expectations as well as capitalist reflections on the remaking of cities. These push forces therefore are bringing new transformation projects of waterfronts, riverbanks, harbors, public spaces, inner city developments and public squares as new symbols of the city. In order to reach a vigorous life, devastated urban settlements are going through a re-designing process and new image urbanities are popping up as new old town centers, remade urban cores, newly developed fragmented neighborhoods
within the formerly built texture. In this rapid transformation process, projects are targeted to boost the economy and help cities compete in an international arena.

Istanbul is the engine of Turkey with its multilayered history, culture and social background, rapid urbanization, increasing population, number of large scale projects and investments. Due to these multilayered components, the city deforms its own pattern and silhouettes rapidly. The city is composed of a mixture of historical, modern, informal, transformed, gentrified, and preserved spatial and social environments. As many other worldwide cities, the city of Istanbul faced rapid urban development, a peripheral sprawl whilst transformation of inner city neighborhoods, forced evacuations or gentrification processes of neighborhoods, physical or non-physical borders within the city or in other words fragmentation.

As many other big cities, the city of Istanbul faced a rapid urban transformation process in the 1980s. Along with economic reforms, formerly prestigious inner-city districts gained new popularity among higher-income social groups, who got attracted to the idea of living in central locations that are close to financial districts (Ergun 2004). Most of the physical transformation associated with globalization has taken place with the development of gated communities, five-star hotels where the city is packaged as a consumption artifact for tourists besides new office towers, expulsion of small business from the central districts, beginnings of gentrification of the old neighborhoods and global images on billboards and shop windows (Oncu 1997). As a result of a new political vision, grand projects of physical and cultural fields started to develop in order to push Istanbul to become part of the global scene (Yavuz 2002). The historical neighborhoods and inner city areas of Istanbul started to host new middle class populations and faced a dynamic in and out flow of population. Today the city continuously sprawls towards East, West and North as shown in Figure 1.

![Figure 2: Urban reflections of the political inputs on the urban development process in Turkey.](image)

In the last three decades, Istanbul's socio-cultural and urban identities have been undergoing a radical transformation. Although Istanbul has always been a city of duality, fragmentations and polarity, the city has
never displayed such intense qualities of heterogeneity before as it is today (Keyder 1999). Economic policies have a strong effect on urban growth and change in the country and in each period the urban environment has been shaped by the economic policies of the state. As in other countries, social and cultural change in Turkey has followed economic cycles (Uzun 2001). While today’s cities are being shaped within the effect of a global restructuring process, urban housing has been evolving by itself with the interaction of these changes. The development of housing areas and creation of the environment are therefore being formed under the effects of a confused interaction between globalization and the city’s own history (Turgut 2010).

Political and economic conditions of the country as shown in Figure 2 flow with the major shifts of the city of Istanbul’s urban development structure. An economic crisis in the 1970s led to the abandonment of Istanbul’s city center, after the ethnic minorities left these neighborhoods in 60’s and stability was achieved only through international loans. Throughout the period of 1961 till 1980s, urban policies mainly focused on housing and underlining the state dues in providing shelters for the citizens. Political instabilities of the period brought a Turkish coup-d'état in 1980 until 1983 and as part of the Social Housing policy, an important input of urban timeline had been the support of collective housing.

On the other hand, since the 1980s, Turkey started to face global impacts and a neoliberal economy from 1984. According to the new political aim, the city needed to be a global actor and therefore Istanbul had to be pushed forward onto the global stage. Grand urban and architectural projects with cultural strategies started to be built up one after another. The upper middle class, who wanted to be out of this process, started to migrate towards the peripheral Istanbul including the Maltepe area at the Asian side. Informal development of the city started to decline between 1980s to mid-1990s due to credit support for mass housing. However, insufficient housing production brought out the model of middle class workers’ housing cooperatives of 1930s to that day as private companies. New gated housing complexes, collective housing and singular buildings were being constructed at informally developed or environmentally potential areas of the peripheral city.

In mid-1980’s, peripheries of Istanbul for residential settlement became more popular for urban middle high and high-income groups and by 2000’s onwards, inner city residential areas became more affordable and desirable for middle-income groups. Although this type of resolution of groups brought the need of security discourse in the world, this tendency depended on other reasons, according to Kurtulus (2005). The reason for security tendency in Istanbul’s case became the urban elites, who were trying to integrate global consumption cultures into their residential area and the supply capacity of the investors who realized the potential of urban elite demand on the urban environment (Kurtulus, 2005). Developments caused by changing economic structures and global influences have created a new metropolitan life-style of middle and upper income groups, which has resulted in a demand for luxurious new houses. The development of new housing patterns over the last thirty years in the city is analyzed in four categories: Garden cities-suburbia beginning from the 1980s, luxurious housing-villa towns and settlements beginning from the 1980s, multi-storey residences beginning from the 1990s and the mixed inner and outer city housings beginning from the 2000s (Turgut 2010, Turgut et al. 2010).
Maltepe is one of Istanbul’s neighborhoods with approximately 450 thousand population and the 10th largest neighborhood of the city. The district is located on the Anatolian side of the city and is a former waterfront neighborhood and today’s newly developing residential area as well, as shown in Figure 3. Maltepe started to develop as a summer residential area on the peripheries of the city of Istanbul and by the 1960s onwards, a rapid urbanization took place especially towards the northern section of E5 Highway of the neighborhood.

Similar to other Marmara seashore Asian neighborhoods of the city of Istanbul, Maltepe started as a formally developing summer residential area between 1930 and 1960 as shown in Figure 4.

![Development timeline of the Maltepe-Başibüyük axis between 1950s-1960s.](image)

1950s: Summer residents. 1960s: Transformation of singular summer residents onto apartment blocks.

**Figure 4:** Development timeline of the Maltepe-Başibüyük axis between 1950s-1960s.

Basically due to rapid migration from east Anatolia to the west, mostly the city of Istanbul faced a huge internal migration and an increase in housing demands. However, lack of housing supplies forced immigrants to create their own housing solutions. Eventually with the internal migration flow to the city and due to the land potential, the neighborhood created a fragmentation through the E5 highway between the south and the northern urban pattern, as shown in Figure 5.

According to this fragmentation, the formally developing residential zone of the south Maltepe was quite an opposition to the informally developing residential area of the north Maltepe. This self-supply housing system brought to many western Anatolian cities and mostly to the city of Istanbul an informally developed area, more or less 50% of today’s whole cityscape and according to the major of Maltepe, Mr. Mustafa Zengin, nearly 1/5 of the total housings in Maltepe are informally built within the neighborhood (URL 1).
1960s: Informal settlements around E5 highway. 1970s: Horizontal and vertical enlargement of informal areas.  

*Figure 5: Development timeline of the Maltepe-Başbüyük axis between 1960s-1970s.*

For the last thirty years in Istanbul, generally the urban pattern was composed of fragments of periods, styles, functions and socio-economic communities as an intense quality of heterogeneity. In this manner, the fragmentation through the physical and socio-economical levels as visualized in Figure 6 through the Maltepe Başbüyük axis, aims to overlay the urban development pattern at a former periphery and a currently developing part of the city of Istanbul.

1990s: Development of middle and high class housing sites via renewal projects or deprivation of forest area. 2010: Infill recreation zone development.  

*Figure 6: Development timeline of the Maltepe-Başbüyük axis between 1990s-2010s.*

Recently transforming and developing Maltepe-Başbüyük axis exposes different housing structures as informally developed former ‘gecekondu’ (slum houses) and ‘apartkondu’ areas, informally developed
cooperation houses for middle income population, formally developed cooperation houses for middle-income population, formally developed singular houses and apartments, social housing blocks by Housing Development Administration (TOKİ) especially around informally developed housing areas and formally and recently developed gated housing blocks for the high-middle social groups. Through this development axis within the defined timeline, this area overlays a significant development model for all the formerly peripheral and currently under the globalization and rapidly urbanization pressured neighborhoods.

SPATIAL IMPACTS OF POLITICAL DECISIONS ON DEVELOPMENT OF THE AXIS

Through 1960s rapid urbanization, informally developed single-storey gecekondu areas started to increase their heights according to family needs, while the 1965 property law and 1972 municipal plan permitted the informal transformation of constructions from gecekondu units to apartment buildings. And with the support of these permits, former gecekondu areas of one or two storey houses, started to shift into the apartments of informally developed areas. This shift in the physical pattern also enforced the starting up of many local construction firms. This current trend created a new market which has developed and get supported among and through informal networks of the informally developing urban areas. These informal networks basically relied on the family, kinship or communal relationships of the immigrants. During this process, Maltepe Başbıyık axis has immigrant communities of the Black Sea and East Anatolia regions at most.

![Figure 7: Development of the Maltepe Başbıyık axis with informal and formal residential units up in the north of E5 highway.](image)

Over the past decade, Maltepe has an increasing value for the real estate market. Many formerly built informal settlements and gecekondu areas are transforming into apartment blocks, mid-high class housing sites, gated housing areas, besides several mass housing blocks shown in Figure 7. According to the former mayor of the neighborhood, Maltepe is with its pros of sea views, earthquake resistant topography, fresh climate and despite its cons of informally developed areas, high socio-economic and cultural differences and the distance to the central city, still attracts the real estate market.

![Figure 8: New development zone at the Maltepe Başbıyık axis up in the north of E5 highway.](image)
Housing Development Administration (TOKİ) served as a project partner for a transformation project informally developed in Başbüyük gecekondu zone, while Istanbul Residence Development Plan Industry and Trade Inc. (KİPTAŞ) constructed a housing site for 6500 unit high rise housing, towards the forest area in the north section of the neighborhood as shown in Figure 8. A private construction firm brought a giant climate blocking wall gated housing site, besides these newly constructed zones in the up-north area. These urban injections, created a rapid shift of the physical pattern of the neighborhood from an informally developed low or mid-rise housings in north Maltepe to the gated-high rise housing areas mixed with formally constructed informal settlements, in addition to huge deprivation of the forest and a great loss of water reservoirs, besides the socio-economic fragmentation.

On the other end of the section line, which formally developed the south section of Maltepe E5 highway, many summer residential housings that are located at the sea shore changed their uses for trade and leisure (restaurants, shopping areas, cafes, etc.) basically with the 1960s rapid urbanization effect. Former summer housing areas of Maltepe, due to the 1965 Property law and 1972 municipal plan lost its singular housing value into subdivided 5 storey apartment blocks. In addition to this transformation, the construction of the 1984 Kadıköy-Pendik infill road by the seaside meant the settlement lost its direct access to the sea.

The new development catalyzed the functional transformation radically. With the infill road’s opening, waterfront areas became a service zone for leisure and commercial activities whilst the infill sea shore zone developed as a green zone. Recently a new addition from 2012 as shown in Figure 9, is a secondary infill structure on site for creating a recreational and an emergency meeting zone, started to get the attention of the inhabitants. The new 120 ha area infill ground was to hold a large meeting zone, culture and leisure activities, green areas and an amusement park within. However the construction decision made directly by Istanbul Metropolitan Municipality by neglecting the district municipality and its community, which created controversy among the neighborhood, due to its decision making methodology and the environmentally negative impacts on site.

These new additions in the neighborhood, according to the politicians, supports an increase in the population of the neighborhood and basically develops an attraction zone via several renewal projects. The transformation of Maltepe area from the north to the seashore in the south clearly shows the fragmentation of physical, social and environmental impacts as well as the physical reflections of neoliberal policies on the city structures. Spatial reflections of globalization and new development based interactions are creating fragmented spaces, societies and a dynamic mixture. This article aimed to overlay this fragmentation of differentiating physical, social and economic layers as well as their development possibilities.

**SOCIO-ECONOMIC FRAGMENTATIONS ON THE AXIS**

The clash of global and local dynamics related to the cityscape creates different spatial forms and rapid changes in socio-cultural and spatial patterns. The rate of change in the urban housing environment is continually increasing as the effects of globalization occur in the contemporary city. Such dynamic processes create a multilayered physical pattern over the course of time. There are numerous interrelated factors to
the growth of cities. Immigrants from rural areas and small sized cities create pressure on existing housing stock and increase the development or enlargement of informal settlements. Natural growth of urbanized groups leads large populations to seek affordable accommodations. Deterioration through excessively high densities of tenants and high density multi-storey constructions replacing the previously constructed settlements, change the social, physical and the economic interrelations of the area.

Recently in regenerating metropolitan, informal settlements or deteriorated housing stock is being replaced with high-rise housing gated communities, geared towards high income groups. Istanbul has been facing this new situation caused by the new social and spatial urban dynamics. Its urban texture has been changing as any metropolis which is undergoing the trauma of warp speed urbanization. According to the international investigation of cities done by the Urban Age Project, Istanbul may not be growing at the dizzying pace of Mumbai and Shanghai, or suffers from the widening social inequality and violence of São Paulo, Mexico City or Johannesburg; Istanbul faces many of the same challenges confronted by all Urban Age cities including London, Berlin and New York's economic stability, social cohesion and climate change (Burdett & Nowak 2009).

In this manner, in the case of Maltepe with a population around 450 thousand, urban regeneration and new development zones are interlinked closely and in some cases mutually interact with each other in physical, social or economic manners. Maltepe until the mid-1990s remained one of the most important industrial zones of Istanbul Asian side (Tekeli 1992). The population is mainly from the central and north eastern Anatolia. Since the land used to be vacant state-owned and close to industrial areas, immigrants were ready to settle in the region. Although the neighborhood has had infrastructure and services since the 1970s, inhabitants couldn't obtain land titles or building permits (Ünsal & Kuyucu 2010).

However, with the neoliberal impacts on urbanization and the land use, Başbüyük, as Ünsal & Kuyucu states (2010), became a poor informal gecekondu settlement, located in a thriving real estate zone. Therefore Maltepe Başbüyük zone suddenly took the attention of the real estate market and brought middle and high class residential projects. And today the region faces a mushrooming effect of an expanding urban and social transformation within nearly every street from south to north of the section line. This rapid transformation however brings physical refreshment to the socio-cultural background of the neighborhood. In this manner, the change is creating a mixed physical, social and economic pattern, and change in fact would not bring any social interaction between communities. This situation in Maltepe thus is another reflection on the fragmented city.

CONCLUSION

Since the 1980s, urban transformation has defined an urban renewal and restructuring process in Turkish cities. Istanbul as Turkey’s global power, has a very large range of urbanization, shift of patterns, former and informal settlements located entwined together, social and economic fragments meeting at every level. Invisible and visible walls/borders meet each other where society literally differs. Today the city contains a mix of all of these fragmentations. Maltepe Başbüyük axis in this manner gives us a possibility to visualize different urban development levels and political impacts on social and physical fields. Neoliberal policies change the city of Istanbul sharply, where politics is quite clear in the research axis. The new urban transformation practice starting from neo-liberal policies brings us not only a new touristic zone but leads the economy to shape the urban environment more than environmental or societal needs.

Maltepe-Başbüyük axis is where the social and physical fragmentation is visible in its formally and informally built pattern. This developing axis also brings several urban critics as the need for migration policies and housing development for the unexpected potential of in or out migrant populations. At the same time, it is also essential to have a sustainable political implementation and urban development strategy within rapidly growing cities as Istanbul. Sustainability is not only for economics but also in political and physical aspects and brings out the potential for better living conditions within the city for the citizens. However, the planning developments for the research zone show clearly that each policy or strategic move gets an opposing step by another institution or policy. Therefore, neither the environmental nor the societal needs or potential are taken into consideration for a better planning option within the region.
REFERENCES


Keyder, C., 1999. İstanbul: Between the global and the local, Rowman & Littlefield, USA.


Tekeli, D., 1992. ‘Development of urban administration and planning in the formation of Istanbul Metropolitan Area’, in I Tekeli (eds.), Development of Istanbul metropolitan area and low cost housing, Turkish Social Science Association, Istanbul.


PEOPLE AND PROJECTS: THE IMPORTANCE OF CATALYSTS IN TEACHING COMMUNITY ARCHITECTURE IN SOUTH AFRICA

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Abstract

Our understanding of architecture has significantly changed over time. Having been trained in a post-modernist idiom in the eighties, one of the authors has witnessed the transformation of the profession and architectural design teaching over this time. Younger architects have been educated at a time of intense debates on relevance, justice and new professional values. They are now having to invent new roles for themselves and develop new methods of practice as they navigate this relatively uncharted terrain.

The teaching of architecture in general, and residential architecture in particular, has significantly changed over the years. Rooted in participatory design approaches and post-modern teaching pedagogy in architecture, this paper re-thinks the design studio, which is now many times extended beyond the confines of the university campus, building metaphorical bridges between academia and communities.

The idea of catalysts is key in terms of achieving an intimate understanding of the settings within which students and staff operate and where project sites are located. Thinking in terms of catalysts influences processes of identifying potential community collaborators as well as potential project briefs and sites.

Some individuals/groups are perceived as “institutions” and champions within their communities: in the sense that they are known, respected, accepted and many activities seem to either be initiated by them, supported by them or revolve around them. Identifying these individuals/groups is paramount to the success of a project. These individuals/groups become agents of change. Planning and design interventions may either enhance or undermine this agency capacity and the potential to institutionalise it. This concept is linked to previous research and writing on urban acupuncture and agency in the built environment.

Identifying where interventions could take place, what kind of intervention and anticipating the kind of influence it would have on the surroundings is critical. Mapping existing energies and forces in an area may provide indicators as to where input may have the most potential for triggering a variety of responses. That is after all the ultimate aim: to intervene where it will generate a response thus allowing more agents to become actively involved in the formulation of the built environment.

Key people/groups and small projects are thus seen as vehicles for collaboration, development and learning. This paper presents a process of engagement between the design studio and communities in a proposed framework for this particular component in the teaching of architecture. These generic concepts are reinforced through some case studies and reflections on practice.

Keywords: catalysts, community, architecture, South Africa.

INTRODUCTION – UNDERSTANDING ARCHITECTURE OVER TIME AND CHANGED TEACHING APPROACHES

Modernist thinking and design processes are now assessed beyond the beautiful artifacts and spaces that they produced – modernism also generated massive failures and hostile spaces. There has been a reaction to this in post-modern thinking and practice. However, Peter Buchanan also refers to “postmodern relativism”, lamenting that it is “powerless to effect fundamental change” due to its “unquestioning tolerance” (Buchanan 2012).

Today, young designers are constantly looking for more relevance and a desire to be of benefit to society – the social intentions of design. This does create some questions around professionalism, practice and the
political function of architecture. And, very importantly, it also leads to questions around how design and technical solutions are generated. But this dilemma is not new to the profession.

The history of architecture has generally been a history of ‘important’ buildings and of patrons who could afford the services of an architect. Massive urbanisation and industrialisation in the 19th century, and the accompanying “exploitation, poverty, overcrowding and squalor” led to a new focus on the social benefits of architecture (Glazer 2009, p. 7).

The social intentions of modernism are well known to the extent that it has been described as ‘evangelist’ in nature: “Modernism was a movement with much larger intentions than replacing the decorated tops of buildings with flat roofs, molded window-frames with flat strips of metal, curves and cirlcles with straight lines. It represented a rebellion against historicism, ornament, overblown form, pandering to the rich and newly rich as rich as serving the needs of a society’s common people” (Glazer 2009, p. 7).

It is generally perceived that modernism aimed to create new, healthier environments for the masses – environments with light and air, and urban parks: “Dwelling’ brought together observations on the deficiencies of sanitation, pollution, crowding and open space availability…” There was a focus on better sanitation, light and air and good locations and parks (Gold 1997, p. 69).

Yet it went on to produce highly controlled environments, which were to a great extent de-humanising in scale/space: “This perceived failure expressed the dwindling belief in the capacities of human beings to shape socio-spatial reality and is commonly attributed to a naive modernist belief in the complete transparency of socio-spatial reality and the human possibilities of predicting and planning the development of society…” (Lindblom 1959 in Oosterlynck & Albrechts 2011, p. 2).

Modernism is also perceived to have aimed towards a form of social engineering and discipline. This started early in history when buildings were assumed to “condition and discipline” as well as to promote “political order or a religious system”. (Bernd & Rouk in Bell 2004, p. 136). Even the “straight line displayed power” (ibid. 2004, p. 138).

Habraken declared that modernism was a regressive movement as it failed to acknowledge the complexity evident in older contexts in terms of multiple decision-makers and articulation of the different levels of the built environment (John Habraken in “10th International Conference ‘Open Building and Sustainable Environment,”’ 2004).

With these changed thinking and differing approaches to architecture and the making of space and the built environment, came different approaches to the teaching of architecture. Present day practice entails thinking beyond the confines of ‘site’ and acknowledging the role that a building has to play in the broader urban context. Then came the acknowledgement that space is co-produced. These have seen major transformations in the profession, moving away for the architect as maverick artist, a “solitary genius” (Buchanan 2012), a “grand tradition of design” where architects operate in isolation and produce masterpieces serving a wealthy strata of society.

Bell explains that architects must explain the importance of the service that they may offer to the 98% of people that do not use the service of architects (Bell 2004, pp. 12–13). The author also explains that this is not a “patronizing” intention and aims to acknowledge the exchange that happens between architects and communities towards the achievement of “quality design for those underserved.”

Alternative approaches to design, development, housing are being explored through changing the interface between architects and their clients, which also affects the interface between universities and their settings – in many cases aiming to move the architectural studio outside the confines of the university campus.

“In the process the university will develop a stronger connection with the city and communities within the city. The city thus becomes the training ground – the laboratory where partnerships and networks are built. This process could then contribute towards the development of a more enlightened approach to professionalism – challenging elitist, expert-driven approaches of the past and acknowledging and respecting local ways of doing, while at the same time improving practice through the application of the wealth of knowledge available at universities” (Osman 2007).
Collaborating with a variety of people within a given community may mean more possibilities for detecting where and how interventions could ultimately have significance, whereby teaching methods are made more relevant, meaningful partnerships, networks are established, communities are empowered through effective participation, skills-sharing and cultural and technological transfer is achieved. This is a 2-way process and implies the creation of a mutual learning ground: from students/researchers/lecturers to local workers (skilled and unskilled), local entrepreneurs, the general community and vice versa. This implies a focus on process where the outcome may not be a built, tangible project but an equally significant unbuilt, intangible process with a purpose to build trust and actively achieve community engagement. Ideally these solutions would emerge from contexts within which we operate and not from an abstract theory removed from reality. This process is further explained in Figure 1.

To achieve these aims, it is becoming apparent that catalysts, in the form of people and projects are key to allow for an understanding of context, an understanding of where interventions are needed as well as an achievement of a balance between “visioning” and “action”, where the short-term interventions are conceived within a long-term vision. (Oosterlynck, Albrechts, Van Den Broeck in Oosterlynck & Albrechts 2011, p. 7).

**Figure 1:** This diagram introduces a processes of engagement which results in catalytic products, processes, mechanisms, methods which may support/enhance a community’s negotiating power. This allows the researcher/practitioner/educator to reach a point of first measurable results to allow for accountability and effectiveness. This is a cyclical processes with the point of engagement always being based on the latest available information.

### CATALYSTS – DEFINITIONS AND INTENTIONS

The idea of catalysts in the creation of space and design is not new. Attoe (1989) described “catalytic architecture” as follows: “It describes the positive impact an individual urban building or project can have on subsequent projects and, ultimately, the form of a city. It encourages designers, planners, and policy makers to consider the chain-reaction potential of individual developments on civic growth and urban regeneration. It advocates design control as part of a catalytic strategy for urban design” (Attoe 1989, p. xi).

The author continues: “Catalysis… is both an appealing metaphor and an appropriate process for rebuilding, one that is sensitive to its context and also powerful enough to restructure it” (Attoe 1989, p. xii). It is interesting to note that it is acknowledged that the “catalyst” may be transformed, merged, disappeared or may remain identifiable in the context (Attoe 1989, p. 70); and there are also failed/negative catalysts – leading to a “failure to light a spark” (Attoe 1989, p. 71).

While the catalyst may be a spatial or architectural intervention, it could also be an individual or group: “A discussion of the chemistry of urban architecture would be incomplete without reference to the people who make it happen. The urban chemist does not stand outside the process but is integral to it and influenced by it… effective people are as important to the catalytic process as a well-conceived appropriately staged development. People get the process going. In one city a corporation executive might be instrumental, in other cities a development corporation, a highly respected individual, a popular mayor, or an alliance of citizens” (Attoe 1989, p. 73). Attoe continues with the chemistry analogy by explaining that the urban
context is less predictable than the laboratory, needing “nudging at the right time” and “appropriate finesse” to keep the process going.

CATALYSTS IN COMMUNITY ARCHITECTURE

Osman (2007) explained that the idea of catalysts is key in terms of achieving an intimate understanding of the settings within which students and staff operate and where project sites are located. Thinking in terms of catalysts influences processes of identifying potential community collaborators as well as potential project briefs and sites.

The author continued to explain that some individuals are perceived as ‘institutions’ and champions within their communities: in the sense that they are known, respected, accepted and many activities seem to either be initiated by them, supported by them or revolve around them. Identifying these individuals is paramount to the success of a project. Collaborating with a variety of people within a given community may mean more possibility for detecting where and how interventions could ultimately have significance.

How individual agents may be “held together” to achieve a “joint direction for a possible future of cities that directly and indirectly might be shared by an unspecified number of individual agents” (Salet and Gualini 2006, p. 3) (Oosterlynck, Albrechts, van den Broeck Oosterlynck & Albrechts 2011, p. 4).

In projects carried out by the author over a number of years at an educational institute, the students, in consultation with lecturers and with identified community collaborators, identified where interventions could take place, what kind of intervention and anticipating the kind of influence it would have on the surroundings. This was initiated by a mapping exercise where existing energies and forces provided indicators as to where input may have the most potential for triggering a variety of responses, the ultimate aim being to intervene where it will generate a response thus allowing more agents to become involved in the formulation of the built environment. It is important also to note that “a strategic approach to spatial planning entails choosing certain goals and places above others” (ibid, p. 3)

Key people/groups and small projects were thus seen as vehicles for collaboration, development and learning. “Co-production implies a specific focus on how spatial transformation may facilitate social innovation both in the substantive sense of improving the satisfaction of local needs and in the process sense involving non-conventional grassroots and disadvantaged actors and groups” (ibid, p. 3). Social innovation here implies the empowerment of socially disadvantaged groups and non-conventional actors in strategic planning processes – this leading to the transformation of space (ibid. p. 5, p. 9).

The author’s previous work with communities thus became a process of mutual learning. Because participatory approaches in design can only be explored through real-life projects, design-build processes became an integral part of the courses. Currently more reflection is needed on these past experiences – especially with regards to the question of the ethics of practice in contexts of poverty and informality. While in the past, little thought was given to this aspect of community engagement, it is evident that the ethics issue will become critical as the profession and academics are being held more accountable.

However, it is also evident from past and present practice in the field that the definition of architecture is being re-considered, professional practice being expanded beyond the conventional and that training of the future architect will have to acknowledge these considerations.

GUIDELINES FOR THE USE OF CATALYSTS AS AN APPROACH TO COMMUNITY ENGAGEMENT

As presented, it is important to identify potential catalysts in any given context before embarking on any interventions. Similar to a process of “reading context” by Hamdi in Small Change, where “pickle jars” and “bicycle shops and bus stops” were identified as the potential catalysts that could be used to generate change in community and context (Hamdi 2004). Also referring to the concepts presented in Small Change, these initial interventions need not be costly or large.
While identifying community might be difficult to achieve in some situations (Hamdi & Majale 2005), using key individuals as potential catalysts might be an approach that facilitates the harnessing the energies of a diverse group of people who may not necessarily be in complete agreement, but who are able to join together in a common vision for their community.

Another aspect to be used in guiding the use of catalysts in the form of individuals and small projects for the teaching of community architecture is the fact that any immediate intervention needs to be understood in the context of a long-term vision for the area where the projects and research investigations are being carried out.

As mentioned previously, the ethical considerations are becoming increasingly important and clear agreements need to be articulated between the community in question and the university.

Several aspects should be considered towards the achievement of these intentions:

• While rapid assessment is needed, and indeed rapid interventions in some cases, this should always be combined with long-term thinking. As preliminary appraisal is being carried out, students should be trained in searching for design clues for the development of the long-term vision.

• Decision-making regarding the key structuring elements for the settlement/context – these may not necessarily be confined to spatial elements – as planning needs to be understood in terms of social and economic development.

• Managing the relationship between community and educational institutes as well as managing expectations is crucial. Ethical considerations and accountability systems need to be considered upfront. While this has not been the norm. Consider ‘parachute architects’ coming into African contexts, building and leaving as quickly as they came – or even our own practice of community engagement over the years where real impact and/or benefits and risks have not been measured and where failures have happened, none have been held accountable. This continues today, as an example, in informal settlements upgrade projects, where the name of the ‘invisible’ architect is rarely mentioned under the pretence that it is a community generated design. This means that no one is held accountable for failures and no clear practice guidelines are enforced to ensure that communities achieve a high quality service.

• Exploring the achievement of more diversity in settlements through studying the not so obvious solutions. This may mean, as an example, consideration of alternative tenure/ownership options and/or using interventions, construction methods, material selection, process decisions as an income generation opportunities for a community.

• Invesitigating design from its various angles. One way is to investigate finance options – questioning where government funding stops or extends – linking that to thinking on where the “city ends and the building begins” (Kendall nd), and equally where planning ends and architecture begins. This means being able to offer insight on community and individual resources and the innovative use of funds. In a similar manner, constantly addressing issues of integration and social cohesion through the spatial and design interventions.

• Consider how technological know-how may be shared through a participatory workshops and adopt an approach to technological and cultural exchange, which takes into account locally available skills as a starting point for a design process. For students and communities equally, this translates into ‘knowing by doing’.

**CATALYSTS – PARTICIPATORY ACTION RESEARCH (PAR) AND COMMUNITY SERVICE**

One challenge with the approach to teaching presented in this paper is the distinction between the projects as an ‘educational process’ versus the intention to deliver a ‘community service’. This is further complicated by the fact that the projects thus undertaken have a strong research component. These various intentions need to be clearly communicated to the community, as well as the extent of involvement. Ideally, the university would have a long-term partnership agreement with the community as this guarantees a level of continuity for both the receptive community as well as creates a ‘teaching ground/environment’ where there is a strong sense of partnership and a high level of agreement/understanding between the parties.
This process of engagement has previously been identified as a process of Participatory Action Research (PAR): Participatory Action Research (PAR) attempts to render development assistance more responsive to the needs and opinions of local people, an alternative approach to development projects usually implemented through a technocratic process. The researcher is viewed as a change agent, who is required to be independent of macro-social organizations. In this process, research is transformed into interactive communal enterprise (Osman 2007).

The author continues to refer to the definitions of PAR, explaining its cyclical and reflective nature where the communication of results implies, not only communication to an academic audience, but also returning the knowledge to the participants (Babbie & Mouton 1998).

Most importantly it is explained that, for both the research and educational processes, an adaptive strategy is adopted; proclaimed the most intelligent strategy (Jones 1976). This is very important when working with real communities in real time. While it is understood that academic programmes are restricting, there must be a level of flexibility in terms of the set brief and the expected outcomes of the projects. This is another reason why multi-year engagement with a select community may render the results more satisfactory to all involved.

TEACHING COMMUNITY ARCHITECTURE – DEFINITIONS, INTENTIONS AND AN OPEN WAY OF THINKING

The approach proposed by this paper has more to do with process than product whereby teaching methods are enhanced and made more relevant, meaningful partnerships and networks are established and people are being educated and empowered through participation, skills-sharing and cultural and technological transfer. This is a 2-way process and implies the creation of a mutual learning ground: from students/researchers/lecturers to local workers (skilled and unskilled), local entrepreneurs, the general community and vice versa.

“Designed and emergent systems are thus seen to be equally important in this possible new set-up. A heightened sensitivity to various forces of urbanisation needs to be developed among practitioners and policy makers. A balance needs to be achieved between stability and transformation in the built environment: Multiple levels of the environment where multiple agents may intervene in transforming their areas of control through complex decision-making, modification, adaptation and appropriation. This will hopefully contribute towards the generation of a layered and complex environment which fosters a sense of belonging, ownership and pride. This is direct opposition to conventional approaches to decision-making in the built environment which is a top-down process, strictly planned and rigid. This strict planning results in monotony, fragmentation, mono-functional environments and dis-empowers people (professionals and communities alike)” (Osman 2007).

It is becoming apparent that there is a need for professionals to have both social and technical skills when dealing with disadvantaged communities. In training future professionals, universities need to instill understanding of informal economies, settlements and structures and the role of the professional in interacting with alternative systems and ‘ways of doing/living’. This need has led to the use of the term ‘community architects’ in South Africa, especially with regards to informal settlement upgrades. However, the terms as used for community members who receive a minimum of training to be able to assist student and professional teams is believed to be rather unfortunate in that it undermines the role that professional architects may offer (Goethe Institut et al. 2012, Hennings et al. nd, Worcester Polytechnic Institute WPI and Community Organization Resource Centre CORC, n.d.) – this terminology also fails to acknowledge that the community architect is a fully trained architect who elects to practice in an alternative manner that ensures participation and relevance (as described in Hackney & Sweet 1990).

While it is important to train future architects in the methods that acknowledge the co-production of space and permit participation, it is also equally important to understand that this multiplicity has technical and spatial implications when making design decisions. A distinction between the permanent and fixed components of the environment are crucial in achieving structure, robustness and identity the adaptable,
changeable and transitory is just as crucial in achieving more complex decision-making process and democratic environments. There also needs to be a balance/interface between the planned and unplanned needs a degree of disentanglement of physical and administrative systems at various levels of the environment, where change in one system does not disrupt the others (Osman 2007).

George Elvin considers the “reconfiguring” of architecture, and calls for systems that allow for participation and choice by the inhabitants, especially in situations where initial funding is limited. He explains the four processes that might be utilised such as remodelling, custom systems, off-the-shelf collage, mass produced customisation (George Elvin in Bell 2004, pp. 32–36): “Construction systems should encourage participation in design and redesign by end users. They should do so with an eye not only for up-front costs, but also life-cycle costs, including repair and maintenance” (George Elvin in Bell 2004, pp. 35–36).

Change and permanence in the built environment have been advocated by researchers and practitioners, one of them being Habraken: “Habraken’s approach suggested that a system of key structures could be placed permanently in the urban environment, to support the infill elements provided by future residents. The idea was to provide accommodation that would meet the needs of future generations, as well as those who first occupied the sites, since infill could be changed with no negative effects on the structural integrity of the whole” (Richard Milgrom in Goonewardena et al. 2008, pp. 274–275).

This ‘Open Way’ of building and intervening in the environment is believed to be very relevant to addressing accessibility and affordability issues in South Africa as well as ensuring more participation and acceptance from the various role players in the process of developing sustainable human settlements (Osman 2007).

CASE STUDY 1 – AN ARTS CENTRE IN MAMELODI, PRETORIA

The Mamelodi Heritage Forum is an existing entity with a centre located in a prominent location in Mamelodi, Pretoria. Over a number of years, the Housing and Urban Environments (HUE) research team at the University of Pretoria have worked in collaboration with members of the centre in various small projects. This was an NRF/UP funded project. The major intervention made was an arts centre within the existing shed structure of the Heritage Forum. This was built by an honours group from the Architecture, Landscape and Interior Architecture Department within the School of the Built Environment in 2007.

Subsequent to that, several small project were linked to the project over the next few years. The project collaborators were mostly local artists, one of whom has just launched a website bokgoni.wozaonline.co.za where he showcases his work, some of it at the arts centre that was built by the UP students.

The ultimate intention was to develop a Centre for Research and Applied Technology, CReaATe, “with the intention of transferring technical knowledge to small, medium and micro construction enterprises” (Osman 2007). It is important to note here, that after several years of experience on this Mamelodi project, the researcher started to replace the concept of ‘technical transfer’ with that of ‘social, cultural and technical exchange’.
Figures 2-5: The top two images are of the arts centre which was constructed within the shelter of a large shed at the Mamelodi Heritage Forum. Both images present the work of artist collaborators from the neighbourhood. Bottom right image is Obed Mahlangu working on a mural as part of the project and bottom right are the UP students constructing a class room in an informal area – both projects that were generated due to the then ongoing links with with specific individuals in Mamelodi.

CASE STUDY 2 – FELICIA’S HOUSE, NELLMAPIUS, TSHWANE/PRETORIA

Felicia’s House is located within a medium-density, low-cost urban environment in Nellmapius, a township near Mamelodi, Pretoria. This is a government-subsidised house, also called an ‘RDP’ house, referring to the Reconstruction and Development Programme and implies a ‘give-away house’ under the Housing Subsidy Scheme.

Felicia looks after orphaned children and the small RDP house has accommodated up to 20 children. The University of Pretoria and Technical University of Eindhoven (TUe) students collaborated (remotely) on designing much-needed extensions to the house and some funding was provided via TUe. The University of Pretoria designs are presented here. The project was also intended to showcase how a typical urban settlement site may be densified using readily-available material and local labour (Osman & Davey 2011).

However, Felicia proceeded to build the house in the manner which she preferred by having a linear building on one side of the plot, not linked to the RDP unit. This may have been due to the limited skills of her builder as it avoids intervening in the existing building at all. It may also be a lack of understanding for the spatial/functional benefits of the proposed extension which might have been better presented/communicated to her by the students and the research team.

This being said, the collaboration with Felicia has certainly led to some improvement in the conditions of the house and it has become established in the neighbourhood as a children’s home over the years.
Figures 6-8: The photograph on the left shows the house before additions and extensions. The plans show how the intention was to integrate the new and old components with the creation of a central courtyard. Photo by Calayde Davey, CSIR, 2011. Drawings by University of Pretoria students as part of HUE, NRF project.

Figure 9: This section shows the two storey planned addition in relation to the single storey existing house and the courtyard created in between (Drawings by UP students as part of HUE, NRF project).

Figure 10-12: Two of Felicia’s children outside the house as it is today, with the new extension (built in 2009) on the left and a solar geyser installed (Photos by author 2013).

CONCLUSION

This paper has looked at the changing understanding of architecture and how this has had an impact on professionalism as well as teaching. Universities have had to adjust to this change, leading academics to take
their students outside of the studio to find real life contexts, situations and people to act as a training ground for students, while also presenting communities with much-needed professional services.

It is here acknowledged that an understanding of catalysts in the form of identified individuals and small projects may become important vehicles for practice and teaching. Some definitions of catalysts are presented as well as the complexities of this not being an 'exact science' and needing intimate understanding of unique circumstances to be able to achieve success.

The paper proceeds to explain and discuss some concepts related to community architecture, questioning the current use of the term and associated problems. The paper strongly advocates for an open way of thinking about the built environment, thus achieving technical and spatial relevance while facilitating the long-term engagement of a community with the structures and spaces created at the outset of a project.

In the use of catalysts in community architecture is further elaborated where the focus on larger visions is believed to be crucial before any short-term interventions are implemented. However, it is also evident from past and present practice in the field that the definition of architecture is being re-considered, professional practice being expanded beyond the conventional and that training of the future architect will have to acknowledge these considerations.

Some guidelines are thus presented in in order to offer some direction when engaging in these kind of projects. Achieving a balance between the individual and the community, between the small intervention and the larger vision, between respect for what is already there and a new envisioned future, between the benefits of a specific community and the links with the wider urban context, between what is permanent and what is transient are guiding factors in these guidelines.

The distinction between these projects as an educational process, community service and research projects is discussed. The links with Participatory Action Research (PAR) are acknowledged. The case studies demonstrate the range of projects, collaborators that might be achieved in this process.

This paper hopes to have argued for a change in professional practice that is presented at university level through well-considered processes that are documented as research and as lessons for future teaching and professional engagement.

REFERENCES


Worchester Polytechnic Institute WPI, Community Organization Resource Centre CORC, n.d. Reblocking: A partnership guide a handbook to support the reblocking of informal settlements though a multiple stakeholder effort, WPI Cape Town Project Centre.
TOWARDS A FUTURE AFRICAN CITYSCAPE: DECO NOUVEAU AFRIQUE (DNA)

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Abstract

Cities in South Africa are transitioning from colonial replicas of former foreign strongholds into settings that more fully represent an African milieu. Apart from obvious changes such as street names, other factors are investigated that might be required to evolve the City of Durban into a habitat that resonates with locals and appeals to tourists, business visitors and government delegations. Taking a cue from the 1925 Paris Exhibition titled International Exposition of Modern Industrial and Decorative Arts, an innovative genre bursting out of Africa has been initiated. The DNA progression, ‘Deco Nouveau Afrique’ originated by Green Heart City, gives cadence to revived energies in artistic frontiers. DNA foregrounds the human ‘heart in art’ as heightening consciousness around wind, wave and sun technologies incorporated into techno-arts. African Indigenous Knowledge Systems are combined with cultural and artistic activity to offer the world another direction in human achievement. Through practitioner-led interventions, a variety of activations are tested by innovators at Green Heart City Movement. These include cultural icons representing the dreams and ambitions of local inhabitants and treating the streets as living beings. Open House Durban is envisaged to unlock the doors of some of the City’s most architecturally impressive, socially intriguing and culturally important buildings. Set to coincide with UIA 2014, Open House Durban presented by Green Heart City will showcase 20 great buildings, from the obvious to the overlooked. The 20 have been chosen to surprise and delight the public, each one offering a unique insight into Durban’s architectural story. An analysis of different activations (green heart regalia, BunnyKats, green felt heartcakes, city poetics, graphic novels, future design, and cultural ecology) reveals the appealing and economically viable innovations to be incorporated into the planning of a future African City. Transnational indigenous knowledge is the glue that can hold Africa together.

Keywords: Deco Nouveau Afrique, Open House Durban, techno-organic arts, green-consciousness, Ubuntu crossroads.

INTRODUCTION

The DNA progression ‘Deco Nouveau Afrique’ gives cadence to revived energies in artistic frontiers. Originated in the City of Durban, South Africa, the human ‘heart in art’ aims to heighten consciousness around wind, wave and sun technologies incorporated into techno-arts. DNA as the next aesthetic, created by Green Heart City, celebrates an innovative genre bursting out of Africa.

In previous centuries Africa has been the Dark Continent that has relied on hand outs from continents regarded as more advanced. The dependency scenario is noticeably shifting into a time and space where Africa is pivoting from begging bowl (receiver) to breadbasket (provider) of the world. The primary area of gifting is the emergence of a platform (DNA) that blends art, industry and telecommunications and stirs the elements into a fresh calabash of the human spirit.

Deco Nouveau extends reinvigoration into cooperation and cohesion of the arts, ecology and humanity with impetus arising from the groundswell of the Art Deco Movement of the 1920s. Art Deco sought to create relationships between art, decoration and industrial design. Part of the Art Deco Movement was dependent on elements from Africa such as abstractness, masks, African figures, circles and triangles.

Aspects of Art Deco spiralled out of Africa into the Paris Exhibition showcase of 1925. Now is the time for Durban – as a top ranking art deco city in the world – to reignite this eclectic energy in techno-arts. DNA combines African Indigenous Knowledge Systems with cultural and artistic activity to offer the world another direction in human achievement.

Africa is emerging as a space that will nourish the imagination of the world by surfing the new wave of techno-arts. Ancient meets hi-tech, with green-consciousness at the forefront of architecture, furniture, clothing, craft and music design.
The world is shifting to new platforms which will require a blending of capitalism and Ubuntu*. Alongside competition and coercion is a drift towards incorporating greater cooperation and cohesion.

The earth has a rapidly expanding population that requires a multi-faceted paradigm that focuses on ‘energising the masses’ through design. There must be a defence in support of mass individualism** through rallying the sectors/forces of Deco Nouveau. Central to DNA is the invigorating of dreams, shapes, and spaces, and for the heart to be seen and heard in shape and performance.

Africa is taking its place in the world and is seen as a pivotal player, serving the world with a fresh integrity green with possibility. In exploring identity amidst the future African cityscape, this paper maps urban outlines and Africanised shapings in visual culture mythologies and mosaics.

SanKofa Book & Design Fair Durban parallel projects presented by Green Heart City Movement and endorsed by the International Union of Architects (UIA) World Congress Durban are foregrounded as contemporary approaches to Urban Design. As such, the design of space is recognised simultaneously as an aesthetic entity and as a behavioural setting (Sepe 2013, Foreword). The projects feature a Book & Design Boma, Open House Durban photography and sketch competition highlighting 20 great Durban structures, and Deaf Pavement Poets rendering nature-themed poetry in sign language amidst mobile pop-up BooK Benches and the Freedom Word Mobile. Various Green Heart activations around the City of Durban have motivated the formation of communities of practice while seeking to retain and enhance place identity (Sepe 2013, Foreword).

“Under the influence of globalization, the centres of many cities in the industrialised world are losing their place identity – the set of cultural markers that define a city’s uniqueness and make it instantly recognisable. A key task for planners and residents, working together, is to preserve that unique sense of place without making the city a parody of itself” (Sepe 2013).

THE CULTURAL ECOLOGY OF CITYSCAPES

Critical to Shumaker and Hankin’s (1984) reflections on place attachment is the notion that few fields of inquiry are as clearly interdisciplinary in nature as the study of human feelings about places. “This theoretical complexity is inevitable, for the emotional bonds of people and places arise from locales that are at once ecological, built, social, and symbolic environments. Although environmental psychologists, social psychologists, and urban sociologists have been particularly involved in analyzing place attachments, architects, anthropologists, folklorists, and humanistic geographers have also contributed significantly to this rapidly expanding field of inquiry” (Hummon 1992, p. 1).

Place-identity theory emphasizes “the influence of the physical environment on identity and self-perception” (Hauge 2007, p. 1). City features such as a vibrant arts scene, quaint bookstores, museums and parks, bustling streets, and an efficient public transport system evoke a sense of place and attachment.

A central feature of a Great City is that it produces legendary leaders in the fields of literature and music. A contributing element of Durban becoming a Writing Capital is the hi-tech culturally relevant library to be erected on the Centrum Site, Middle Durban. SanKofa Book & Design Fair Durban anticipates that the new library would house an African Writers’ Museum.

American anthropologist Julian Steward defined ‘cultural ecology’ in his 1955 book, The Theory of Culture Change as “the study of the processes by which a society adapts to its environment” (About.com). There are cultures and places that would have died out long ago if they had not adapted to the physical landscape and changing political economies.

International websites such as The Culture Trip and CNN Travel list a number of festivals and cities in Africa as worthy of inclusion in travel itineraries. These include the Cairo International Book Fair; Algiers waterfront and terrace cafés; Lamu, a UNESCO World Heritage Site in Kenya; the carefully laid-out network of cycle lanes
in Bulawayo, Zimbabwe; a spellbinding fishing village in St. Louis, Senegal that boasts 200 vibrantly painted fishing boats; Maun, Botswana as the perfect place to launch your safari; Windhoek Street Festival and Oktoberfest; Grahamstown National Arts Festival; and Kumasi’s seemingly limitless Kejetia Market in Ghana (Molocha, Eveleigh 2013).

South Africa’s heritage tourism attractions include the Cradle of Humankind at Sterkfontein Caves in Gauteng; Pinnacle Point Caves at Mossel Bay, Western Cape; and the suburb of Yeoville in Johannesburg. Sterkfontein is the world’s richest hominid site. “The site is also renowned for studies carried out on fossilised fauna, wood and stone tools which were made, used and discarded by hominids in the past” (SA-Venues). Pinnacle Point Caves at Mossel Bay is the site where a team of archaeologists found amazing evidence of occupation by people from 170 000 and 40 000 years ago and the earliest evidence in the world thus far of the systematic exploitation of marine resources and symbolic human behaviour (Mossel Bay Municipality).

Various diasporic communities have made Johannesburg their home. The suburb of Yeoville is the “cultural melting pot of Johannesburg where the Rastafarian, the gay, the Nigerian, the Ethiopian and a host of other cultures occupy a dynamic but harmonious niche” (Joburg 2012). It is said to be one of the most diversified suburbs in the world.

**UBUNTU ON THE SIDEWALK**

The main streets of a bustling City Centre, abundant with a variety of traffic, represent ‘Ubuntu crossroads’ where different cultures can interact in an environment offering colour and excitement. The streets in urban spaces reflect the plurality and the fundamental underlying multiculturalism with every passerby on the ground who may be from a different continent and brings with him/her an entirely individual culture (Pande 2010, p. 4).

The Green Heart City Movement hosts eco-arts activations featuring hearing and Deaf Pavement Poets sharing sign language poetry performances accompanied by harmonica and accordion tunes at outdoor spaces such as pavement cafes and parks. The eventings create awareness around Deaf culture, sign language, and visual attentiveness.

![Deaf Pavement Poet Ismael Mansoor renders a signed poetry performance at the Corner Café, Durban (Photo: Ravi Moodley).](image)

Deaf and hearing cultures attach different values to activities favouring vision or sound. Walking out with awareness, Deaf Pavement Poets could assist hearing urban landscapers in reading the rich texture of the sidewalk, and treating the streets as living beings. Street culture holds a mirror to society; the street assuming a stage where the drama of life unfolds. In her walks with expert companions, psychology professor Alexandra Horowitz explores different levels of attention to “unravel all the unseen, unsmelled, and unheard miracles of a city block, the wonderlands of sensation and awareness that bloom behind the looking glass of our evolutionarily primed everyday inattention” (Popova 2013).
SANKOFA BOOK & DESIGN FAIR DURBAN

The International Union of Architects (UIA) World Congress Durban has endorsed three Green Heart City Movement parallel projects under the umbrella of the inaugural SanKofa Book & Design Fair Durban to be held from 01 to 17 August 2014. This will mark the first book fair for Durban and is set to become an annual feature on the City’s cultural calendar. The event is themed ‘Open Source Open City Open Season,’ with the slogan: ‘SANKOFA Writing with the Future writing with the Past’. The Design platform will showcase reading lamps, book covers, bookcases, bookshelves and the SanKofa Reading & Storytelling Chair. The three parallel projects are:

Green Heart City Book & Design Boma
A meeting place for writers, illustrators, publishers, literary agents, booksellers, designers, architects and social entrepreneurs to network and exchange ideas trending on the literary and design landscape. KwaMuhle Museum will serve as the Nerve Centre for Boma activations. Key elements include The Frameside Lounge, Open House Durban Photo & Sketch Exhibition, Word Garden with TreeNotes, Green Heart City Identity Display, BookCamp and Caravan of Words where writers will craft stories on ‘Durban and Democracy’. The KidZone will feature Life Size Scrabble, storytelling and character role-plays from African folktales.

Food Wagons will serve traditional local foods - bunny chow, samp and beans, and local beverages such as Frankie’s Ginger Beer from the Midlands. The Freedom Word Mobile – Kunene Wagon will be stationed at the Book & Design Boma and promote an African Writers’ Museum. The Tower of Text (ToT) experience invites UIA 2014 delegates to build a Book Tower out of contributed books which will then be dropped off at orphanages, old age homes, and correctional centres. The ToT is structured as an attempt at the Guinness Book of World Records.

Open House Durban
An artetexture showcase, Open House Durban is envisaged to unlock the doors of some of the City’s most architecturally impressive, socially intriguing and culturally important buildings. Open House Durban will highlight 20 great buildings in recognition of 20 years of democracy in South Africa. From the obvious to the overlooked, the 20 have been chosen to surprise and delight the public, each one offering a unique insight into Durban’s architectural story.

The 20 Durban structures will be documented through the photographic lens and the sketch block – to promote the idea of creative economy. UIA 2014 delegates and the public will be invited to photograph and/or sketch some or all of the buildings during a 20-day period from Saturday 26 July to Thursday 14 August. Submissions will be displayed as part of a Photo & Sketch Exhibition and prizes will be awarded for the winning photograph and sketch including impressions statement in each of the two categories: Open and UIA 2014 Delegate.

Figure 2: Preliminary drawing of ‘le Grande Situpon’ SanKofa Reading & Storytelling Chair by Durban-based multi-media artist Helge Janssen 4DNA.
Participants will be encouraged to write stories about what they felt about Durban and the building/s they had documented in particular. The 20 structures that feature as part of Open House Durban 2014 are:

1. City Hall Durban  
2. Memorial Tower Building, UKZN Howard College Campus  
3. Surrey Mansions  
4. Diakonia Centre  
5. Mariannhill Monastery  
6. Phansi Museum  
7. KwaMuhle Museum  
8. Mazisi Kunene Museum  
9. Suncoast Casino and Entertainment World  
10. The Playhouse Durban  
11. Alliance Française de Durban  
12. Royal Natal Yacht Club  
13. uShaka Marine World  
14. Moses Mabhida Stadium  
15. Enterprise Building  
16. Old Station Building  
17. Emmanuel Cathedral and adjoining historical cemetery  
18. The Bat Centre, Small Craft Harbour  
19. Rossburgh Fire Station  
20. Las Vegas apartment block, North Beach

Figure 3: A Sign Language mural painted by Deaf and hearing artists on the outer wall of the Visual Art Studio at the Bat Centre attracts interest amongst local and international visitors (Photo: Sanabelle Ebrahim).

Mobile Pop-Up BooK Bench with Deaf Pavement Poets

‘Parks 4 Read’ is an ongoing initiative that is held in a park setting. BunnyKats, leprechauns, and Irish rag doll Bridie Beag exchange integrated tales to encourage a love for reading and drawing. This is achieved with the assistance of local writers and artists interacting with the public and sketching BunnyKats reading miniature classics on the BooK Bench. Hearing and Deaf Pavement Poets will write and perform poetry covering 20 years of democracy in South Africa and what it means.
Figure 4: Musician Richard Ellis (left) and authors Hitesh Surujbally and Victoria Pereira exchange integrated tales on the BooK Bench at the SanKofa BooKmarKet Durban stand, Sustainable Living Exhibition, September 2013. BunnyKats; Bridie Beag Little Brigid, the lucky Irish rag doll; and Leprechaun encourage children to read as they pore over miniature classics (Photo: Sanabelle Ebrahim).

GREEN HEART CITY MOVEMENT

Green Felt Hearts Poetry Arts Experience is a citizen-based organisation in association with Cycles 4 Social Justice (C4SJ) and Ecology & Cycling that encourages arts and poetry experiences around themes of ecology, sustainable living, fashion and cycling. One of the aims is to have everyone wearing a green felt heart as an emblem of fostering a continued love affair with the natural environment. The hearts will assist Durban in being affectionately known as Green Heart City. The plan is to establish an international Green Heart Movement originating from Durban. The organisation is registered with the World Poetry Movement.

Green-hearted BunnyKats are made by crafters at the Hillcrest Aids Centre Trust. The BunnyKat motto is ‘Read Write Draw... X-plore’. During a recent visit to Ireland, a pack of BunnyKats befriended traditional leprechauns at the Leprechaun Museum. The intertwining of BunnyKat and Leprechaun folktales advanced the idea of linking Durban and Dublin as Writing Cities.

Figure 5: BunnyKats green-hearting at Tourism Indaba Durban 2013 (Photo: Sanabelle Ebrahim).

Green Heart landscape sculptures, climate regalia, BunnyKats, green felt heartcakes, city poetics, futuristic design, and cultural ecology reveal some of the appealing and economically viable elements to be incorporated into the planning of a Great City on the east coast of Africa.

The Green Heart Movement seeks to position Durban as Green Heart City, in a similar light to the way in which New York is known as the Big Apple and Paris is referred to as the City of Love. In South Africa, Cape Town has the Mountain, Johannesburg has the Brixton Tower and the mine dumps, and now Durban is becoming recognised for the giant Green Heart, following on from earlier but fading symbols of bananas, sugar cane, rickshaws and surfboards. The key challenge for a city brand revolves around the issue of how to develop a strong ‘umbrella’
brand that is coherent across a range of different areas of activity with different target audiences, whilst at the same time enabling sector-specific brand communications to be created. In order to develop a strong brand, policy makers need to identify a clear set of brand attributes that the city possesses and which can form the basis for engendering positive perceptions of the city across multiple audiences. Such attributes are those that the city brand would wish to see evoked when relevant target groups are asked the question, ‘What comes to your mind when you think of this city?’ (Dinnie, 2011, p. 5)

The ‘Green Heart City’ reference celebrates Durban as a leading eco-city in Africa. Visual cues include the beachfront promenade, sustainable building design of the Moses Mabhida Stadium, development of a clip-on cycle bridge that crosses over the mouth of the uMngeni River, and, as a legacy symbol arising out of COP17, the Living Beehive structure in Durban Botanic Gardens, Africa’s oldest surviving botanic gardens.

![Image of Green Heart City](image1)

**Figure 6:** Idolobha Elinhliziyo Luhlaza - isiZulu version of the phrase ‘Green Heart City’ (Artwork: Sanabelle Ebrahim).

Highlighted below is a proposed activation by Green Hearts to revitalise a semi-utilised Durban eco-scape, the extensive gardens running alongside Margaret Mncadi Avenue (formerly Victoria Embankment) to realise an attractive feature integrated into the expanding Smart Port of Durban.

**GREEN HEART BOULEVARD**

The Embankment vicinity has palm trees, cobblestone footpaths, yachts, bicycles and ecological abundance. The envisaged Green Heart Boulevard offers an ideal public space such named to hearten locals strolling along the Embankment sporting green felt hearts and interacting with artists, Deaf Pavement Poets, accordionistas and penny-whistle players while enjoying Durban’s glorious weather. The socially refreshed Embankment would follow the curve of the yacht basin and evoke an infectious carnival or mardi gras atmosphere.

![Image of Embankment](image2)

**Figure 7:** View of the Embankment from the Royal Natal Yacht Club (Photo: Sanabelle Ebrahim).

The name Green Heart Boulevard echoes the affectionate new reference to Durban as Green Heart City. The ‘Green Heart’ title can be anchored by constructing a giant green heart sculpture towering above the
Embankment festivities. The sculpture would be visible from aeroplanes and cruise liners, making it a prominent symbol for the City-Port of Durban.

The sculptural theme of ‘Ancient meets Hi-tech’ would showcase an iconic Green Heart design that features elements of ancient African wisdom. Symbols such as the Sankofa bird, complemented by a weather vane and original sayings sandblasted on to the sculpture, example ‘Green hearts beat fresher’, ‘Take a walk on the Greenside,’ and ‘Green with Glory’ would be included. The structure will be powered by solar film, dye solar cells and LED lights, coupled with sound effects celebrating Durban as the beating heart of South Africa.

![Figure 8: Preliminary drawing of the Great Green Heart Landscape Sculpture by world-renowned artist Alex Flett 4DNA.](image)

A rekindled fondness for Durban Harbour will foster an invigorated identity for an advancing Smart City-Port and endear the public with a sense of place attachment. Proposed activations include adventure trips on the narrow gauge railway line that feature art and environmental workshops on the Fun Train, a BayWide BookBarge, and SanKofa Book Bridge spanning the City-Port transforming the Embankment into a bustling locale of choice. City-Port culture spin-offs include enhanced hospitality and tourism opportunities in the Greater Durban Area.

A working harbour with an atmosphere of glorious African fantasy is envisaged. The active features of the harbour – giant cranes, storage sheds, shunting yards, trains and carriages – would be culturally-decorated and painted in Zulu beadwork or zebra-stripe graphics. A symbiotic relationship between the citizens and the port will see the citizens of Durban as part of the harbour and the harbour a part of them.

![Figure 9: View of Durban Harbour from the Royal Natal Yacht Club Photo: (Sanabelle Ebrahim).](image)

**Implementation**

The name Green Heart Boulevard evokes a vibey arts fest culture, adding fascination to the proposed Integrated World Expo (IWE) that would stretch across an inner city band and side streets bordering The Playhouse ending up on The Boulevard. The revitalised Embankment would provide great opportunity for
outdoor art exhibitions, Botanical Backdrop Picnics, street musicians, mime artists and other cultural activities.

The Green Heart Boulevard concept entails linking cycle trails alongside the central bayside embankment with interactive landscape structures, bandstands and pavilions. This will promote, in particular, opportunities for blind and other cyclists and Deaf Pavement Poets to be integrated into the wider public with The Braille Trail. Both innovative and exhilarating, the trail emphasizes open spaces in the City with a refreshing determination to grace the scene.

The intention is to use the Victorian subways – some of which are permanently sealed off with barbed wire – as a link to the harbour and narrow gauge railway line. A weekend library on the Fun Train will encourage the public to ‘let reading be their lifestyle’. The initiative would serve as a link to the new Durban Library planned for the cultural precinct in the City Centre.

A Deco Nouveau Afrique (DNA) ethnic fence incorporating images of green hearts, caterpillars, butterflies, sunbursts, windmills and leaves will be made from traditional materials such as wood, grass, stone, wire and beads.

Specialised car guards would be integrated into the concept. To add atmosphere, car guards will be dressed in flamboyant costuming featuring harlequin hearts and berets instead of orange bibs.

An annual S’dumo Bike Festival on the bayside embankment will spark renewed love for the cycle and cycle ownership. The S’dumo bike was used as a form of cultural representation linked to social attentiveness in the days of cycling in the outlying areas of sprawling townships of the 50s and 60s. The public will be invited to create cultural heritage cycles that showcase KwaZulu-Natal.

Figure 10: ARROWSA-Bechet Ubuntu S’dumo Bike (Photo: Mary Lange).

Cycle lanes will be constructed on the harbour’s edge. People will be encouraged to ride bamboo bikes. Yoga and tai chi weekend sessions will be held on the grass verges.

Each participating school will be allocated a 100m grass segment to plant with. Organic horticulture will include indigenous plantings and vegetable gardens. Annual competitions will be held at year-end for the best maintained grass segment.

Wind Instrument Weekend will showcase the Jewish harp, flute, harmonica, concertina, accordion, harmonium and African drum, linking to the pipe organ at City Hall Durban. Deaf Pavement Poets will deliver nature adventure poetry and theatre acts on the harbour embankment.

Community impact
Sections of the long embankment will refresh some of the run-down and neglected City areas such as Albert Park and Park Street. This will enrich the lifestyles of the inhabitants and provide a boost to the economy by way of artistic expression and tourism. Some of these run-down areas can be linked up to the harbour by a footbridge erected across the envisaged magical esplanade. Footbridge arches are to feature traditional designs, wire and beadwork.
Sustainable positive impact
Equal and open access and mainly free eventing will provide opportunities for strollers, flower sellers, sight-seers, cultural promoters, artists, landscape sculptors, musicians, performers, Deaf Pavement Poets, cyclists, and buskers.

DNA (DECO NOUVEAU AFRIQUE) - FUTURISING THROUGH AN AFRICAN LENS
Taking a cue from the 1925 Paris Exhibition showcase titled International Exposition of Modern Industrial and Decorative Arts (French: Exposition Internationale des Arts Décoratifs et Industriels Modernes), Integrated World Expo (IWE) seeks to reignite this eclectic energy into cooperation and cohesion amongst the techno-organic arts, ecology and humanity.

Motivated by Green Heart City, Integrated World Expo (IWE) is scheduled to be launched in August/September 2015. The event will feature several strands including industrial design, architecture, furniture, jewellery, fashion, live painting, visual theatre, cinema, screen dance, scriptwriting, poetry, music, photography, SanKofa Book & Design Fair Durban, murals, and geographic foods.

The 2015 edition will incorporate a Deaf Pavilion to encourage Deaf/Hearing artistic collaborations. Consequent exhibitions will focus on different marginalised communities such as the blind, albino, paraplegic, and autistic.

Green Heart City Movement envisages that IWE serve as an annual platform for integrating global artists and industrial designers. One of the prime aims of IWE is to encourage greater integration on a global scale. IWE seeks to integrate South Africa into the whole of Africa, and then Africa and South America increasingly into the wider world.

As part of the legacy of IWE, Durban will benefit from the support of visual practitioners in setting up iconic green heart activations around the City. Themed ‘X-citement from Your City’, each Friendship & Sister City to Durban will be invited to send a heritage item to IWE. A Friendship & Sister City Pavilion will showcase these heritage items which could be anything from a book to an eco-vehicle, artwork or opera star.

Figure 11: Green Heart City waistie by Helge 4DNA (Photo: Helge Janssen).

SANKOFA MYSTICAL SKYBIRD
Integrated World Expo (IWE) proposed by Green Heart City Movement is guided by the concept of the Sankofa bird as uniting humanity across the globe. The Sankofa bird floating across the continent in the crisp air of Africa is a powerful image which can be incorporated in watch, jewellery, wallet, clothing, and furniture design using feathers, shweshwe fabric and other materials. As part of continental integration in design and fashion, ancient symbols such as the Sankofa bird need to become more embedded in contemporary consciousness, conversation and street buzz.
The principle of Sankofa is symbolized as a prophetic bird born from the wisdom of Ghana’s Gyaman and Asante cultures. The West African symbol represents the importance of understanding one’s past in order to build for the present and future. The symbol itself is a bird, which signifies the human spirit. The head of the bird points backwards toward the past, and it holds an egg in its mouth, which represents the wisdom of our origins. Sankofa is a principle of hope, which states that in order to know how to obtain one’s goals and dreams, one must understand his or her history and use that knowledge to make healthy choices and decisions for the future (Sankofa Empowerment).

CONCLUSION

The notion of Africa Rising epitomises a “giant continent awakening from poverty and disaster, now bursting with hope and opportunity” (Perry 2012, p. 32). According to the International Monetary Fund, GDP (gross domestic product) across sub-Saharan Africa’s 48 countries has risen on average by 5% to 7% per year since 2003 (Perry 2012, p. 33). Of the ten fastest-growing countries in the world in the past decade, six were African (Perry 2012, p. 33). “Business increasingly dominates foreign interest in Africa. Investment first outpaced aid in 2006 and now doubles it” (Perry 2012, p. 34).

Receding African pessimism paves the way towards a unified continent invigorated with imagination and renewed purpose. Alongside policy, inclusive methods of unifying nations through the fusion of people and environment may be achieved at the crossroads of eco-arts and crafts, industry and design.

An intervention based approach guided by devising a grouping of progressive enablers can be designed to create an enhanced city experience. This is integral to accelerating the transition from colonial atmosphere to Africanised environment in the future African city.

God bless Africa,
all her sons and daughters
and her Great Cities of the future
Notes

*Ubuntu is an Nguni word which has no direct translation into English, but is used to describe a particular African worldview in which people can find fulfilment through interacting with other people. Thus it represents a spirit of kinship across both race and creed which united mankind to a common purpose (Boddy-Evans n.d.).

**Mass individualism refers to a trend where companies offer consumers options for customising their mass-produced purchases in an attempt to help consumers feel that they are being served as individuals (Shaw 2005).

REFERENCES


Pande, A., 2010. Where the streets have no name, Salaam Baalak Trust, New Delhi.


THE CHALLENGE FOR PROSPERITY IN MEXICAN CITIES

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Abstract

Market laws determine today’s cities by prompting them to make a profit, thus pushing them into a financial and territorial re-structuration which brings about overcrowding. This is the neoliberal model, with its characteristic open economy, wherein several sectors’ interests prevail over social groups, hence, conditioning worldwide development.

Urban development and transformation phenomena are a constant in communities. This study-work identifies two contending perspectives in today’s urban advent, especially for cities like the ones in Mexico. The first perspective refers to the neoliberal model, stuck in the globalization process, and also to the way governance prompts developing cities to adjust their structures in order to achieve economic development. The second perspective refers to the Prosperous Cities Initiative of U.N.-Habitat proposed in 2012 whose strategic political project prompts local governments to commit to adjusting politics, strategies, and actions towards the new concept of prosperity.

This study-work analyzes both of these perspectives; hence, their main characteristics are drawn and are also linked to urban development in Mexico. The intention is to push Mexican public politics, before urban development and transformation phenomena, to be holistically managed, by binding strategies in an inclusive and creative manner. Finally, the planning of several challenges and the actual realities toward the achievement of prosperous cities in Mexico are also presented.

After thirty years of a non-equitable developmental model, and before an initiative disguised as equity, the question arises, is the Prosperous Cities Initiative actually convenient to Mexico?

Keywords: challenge, prosperity, holistic, globalization, quality of life.

INTRODUCTION

The city plays an important role as an intervention sector, widely acknowledged in the global context. Urbanization has increased as a result of overcrowding. To face the global market, metropolitan areas concentrate urban infrastructure to be able to offer multinational companies the necessary tools to spot investors and make a profit.

By claiming development, urban politics turn cities into urban markets where productivity, equity, infrastructure, and environmental sustainability are still very far from conciliation. Better quality of urban life is a constant in strategic agendas of public administrations. Consequently, cities face two big challenges, to fight general crises and to head towards prosperity.

THE GLOBAL CONTEXT

“Globalization may be understood as a developmental theory which shows better integration among different regions around the world as its biggest feature, but this level of development obviously affects social and economic conditions of countries” (Trejo 2008).

Economic development

Generally speaking, development should imply favorable and progressive changes. As a verb, ‘to develop’ means the way changes will be made, but as an adjective, ‘developed’ is seen as a judgment where differences are to be considered. In 1949, the world was first labeled in zones, “developed and undeveloped” (Obregón 2007, p. 3); later, the concept was re-defined due to its close relation to economic growth.
Developing countries were then born, and more recently, the connotation ‘emerging economy’. Historically, cities have been and will continue to be instrumental to and a result of economic and social development, thus, it is mandatory to achieve better performance when conducting city affairs.

There are two general aspects to be minded when it comes to economic development. First off, the paths to better economic growth support must be identified. However, let’s not forget that it is the city, the one and only trigger to economic growth. Secondly, and probably the hardest one, is to have the city dwellers integrate to the development process, because the city belongs to anyone who, by working, also generates urban productivity; in other words, “the city must turn inclusive” (Trejo 2008, p. 45). It comes easy to mention these two aspects, productive and socially inclusive, but very hard to get them to conciliate.

NEOLIBERALISM AND THE CITY

In many different countries, the neoliberal model, characterized by its open foreign economy, has turned exports into the main axis of the accumulation system where different sectors impose their interests upon social groups. In this model, development is expected to generate ‘the trickle-down effect’ which states that wealth on the top should mean benefits to society, but it’s not always like that; sometimes, life conditions may improve, but hunger and illiteracy remain.

**Governance and urban development**

By definition, urban politics have always been in charge of promoting economic growth. But in modern cities, globalization, influenced by multilateral politics, has inflicted a change. Despite trying to integrate social activities to target areas due to their potential for production as well as their contributing to the nation’s wealth, today, economic aspects prevail over social aspects. Basically, the tendency is to make the city more productive by investing in its infrastructure and by guaranteeing liberty of performance to prospective investors.

In this regard, the city is perceived as an intervention object. This economic development scenario is subject to external elements that condition urban development. The World Bank contributes with nearly half the public financing for urban projects in developing countries; it does this to affect structural adjustments. Developing countries must overlook protection norms, privatize national assets and companies, and create new reforms to be able to lower operation costs. Simply put, the World Bank proposes “to re-consider urban planning in order to control global reality”.

According to the World Bank, governance is “the way to enforce power in the management of economic and social resources of a developing country”. This statement was borrowed from the institutional economy in U.S.A.’s developing prime time; according to Osmot, this concept is the constitutional frame which allows controlling operation costs better. The necessary technical elements shall be generated for management transparency, and shall be responsible for social and economic development. This structural adjustment has “governance” as its main instrument, and it’s applied to the city in order to make it part of a system of rigid hierarchy.
These adjustments by the World Bank took place in the 80’s and 90’s. The objective was to control urban development through institutional system control that, according to neoliberal politics, is the goal to accomplish. A map that concentrates the main characteristics of urban planning neoliberal re-consideration was built in order to control global reality and, from my personal point of view, the opportunities for performance. See Figure 1.

List of considerations:

- Regarding economic development, the paths to better support and to make the city inclusive must be found.
- The tendencies consist of making the city more productive and to invest in its infrastructure; the city is looked at as an intervention object.
- It also must be considered that cities are vulnerable in population and urban aspects (including migration).
- It is subject to international organisms.
- The World Bank considers the city as a structural adjustment element.
- The World Bank uses governance as its intervention strategy, thus, being able to control urban development through the institutional system.
- The consideration leads to work on integration ideas, visualizing the city as a palimpsest which would establish a dialect that should organize urban context in continuous motion.

The city binomial

Nowadays, the perception of the city, both emotionally and effectively, has decayed. The city “seems to have turned incomprehensible” (Carati 2004, p. 13), for most city governors, this fact is not perceptually relevant, nevertheless, cities communicate, and they’re emotional. Urban dimension tracing goes beyond material or formal aspects, the city, in current terms, offers a variety of available archetypes that shall be taken advantage of.

If we consider the city as the binomial ‘material city – non-material city’, we meet the actual shape and the substance that binds, made of human motion and traveling that we realize within the solidly built city. To reach dialogue between these two parties, involves the binding of micro and macroscopic components. Yet, globalization does not seem to recognize this binding need.
“The actual project, the material city that defines the city boundaries, is inevitably dependent on the political design of socio-economic planning; it always deploys perfectible results, never absolute. It also reacts to the actual city with certainty, to the continuous advent demands, to real time necessities and urgencies of the community. The material city planner should not overlook obsolescence in design, he or she shall satisfy social interests with an aesthetic vision” (Landry 2009, p. XXIII).

The transparent city, the non-material city, is made of the lives of people that inhabit it, and of their fleeting traces left on the environment. “The non-material city is generated by the presence of human beings; it’s a communication system wherein people socialize on the urban scenario by performing daily activities, be it formally or informally”. The non-material city is everything we feel, individually or collectively; it is the impressions, pleasures, as well as spiritual and bodily pains. “Here we live, on the streets our smells bind, smells of sweat and incense, of new bricks and underground gas pipes, our tense and idle flesh, but never our gazes” (Fuentes 2008, p. 26).

The material and non-material cities intend to synthetically describe the elementary urban place, they help us visualize the combination, integration, correspondence, and the imposition given by the complex environment, well structured, layered, relational, and of multiplicity, that we call city.

In spite of what multilateral politics dictate, it shall not be forgotten that city space is one of collectivity, one that represents the place where dwellers realize their own personal quests. Places are defined by streets and buildings; they offer different tours, thus, giving space a unique sense, representative and symbolic. According to Carlos Mijares, the city is an unfinished book read by its inhabitants day to day.

By making reference to the binomial material city – non-material city, we intend not to forget our human essence as architects in an environment of urban planning. It is our duty to see about city advent because it is there, ultimately, where -given globalization- most architecture is done.

QUALITY OF LIFE

Cities face big challenges, amid these, to offer better quality of life to their dwellers. “The concept Quality of Life, is used for different purposes aimed towards the people, for instance, as support to national and international politic formulating. The concept is generated by social processes after the acknowledgement of basic needs: housing, education, and health. There are external factors of environmental character of complex solution which fall into this concept, but to the traditional external social issues, poverty and unemployment, we must add others of psycho-social character, derived from management and organization models, as well as from the ways to inhabit; an example given is the neoliberal developmental model which has been referred to in this work-study. Quality of life is a useful construct to measure satisfaction and welfare; it is reached by means of different objective and subjective factors such as happiness, health, political stability, security, family and community life, climate, geography, gender equity, and social stability” (Trejo 2013, p. 4).

As an axis does, the Quality of Life concept must be led to propose improvement to current city issues, from a “holistic perspective of that issue, present before the inner built city” (Amadei 2002, p. 85); the soaring of its levels is a constant topic in strategic agendas of international public administrations.

In order for cities to offer better quality of life, the World Bank (Borja & Burgess 2002, p. 89), presented in 2000 “The New Integral Developmental Scenario of Cities” whereby, it is stated that cities should comply with four characteristics or conditions:

• They must be competitive (they must correct administrative inefficiency and reduce operation expenses).
• They must work on the quality of life (environmental decay, crime, improvement of urban services and infrastructure).
• They must have good government and management by increasing the number of resources towards urban intervention through service privatization politics.
To show bankability “let the city show financial support, increase its income, in other words, credit liability criterion” (Trejo 2013, p. 5); certainly, all of it in pursuit of access to financing.

A map which concentrates all these points, and which also includes personal stands has been made (See Figure 2).

Before urban transformation and development phenomena present in cities and neoliberal multilateral political tendencies, it is now the time to analyze the other perspective, the Prosperous City Initiative of U.N.-Habitat.

THE CHALLENGE FOR PROSPERITY

Prosperity is implicit in cities, it is the result of social and institutional innovations. It implies long term vision and consideration of different elements. It is the city, the place where human beings satisfy their basic needs and have access to public essential assets, where ambitions, aspirations, and other material and non-material aspects of life are realized, hence, providing joy and happiness, where individual and collective progress perspectives can be realized. Prosperous cities consolidate and solidify the right to common assets; urban planning and organized social participation are essential elements in them.

Figure 2: New scenario of city integral development (Prepared 2008).
If assertive strategic planning were realized by adequately investing in people (education, health, and employment) with the intention to train them to be able to hold actions and options that favor them, and that would also benefit social common assets, we could aspire to have prosperous and sustainable cities; cities with labor strength that could also impulse economic development, whose inhabitants might also favor social economic welfare, where adults would enjoy good health and would also be able to participate socially and economically.

**Prosperous City Initiative U.N.-Habitat**

The way to prosperity implies the consideration of different dimensions. Prosperous City Initiative (U.N.-Habitat 2013) is a political strategic project for local governments that commit to adjust politics, strategies, and actions toward the new concept of prosperity. The initiative articulates local, regional, and global issues, and even though volunteer, it's also responsible; the initiative provides developmental assistance, analysis, and strategies, among others. It is commanded by prosperity norms which, when observed and followed, will lead to a Prosperous City Certificate.

The initiative suggests five dimensions: equity, infrastructure, quality of life, environmental sustainability, and productivity. Urban powers (laws, regulations, and institutions) serve as its main axis.

- Infrastructure must be kept systematically for a long term by assisting communications and transportation.
- Environmental sustainability demands compact cities, energetically efficient, with investment in renewable energy, less polluted, accessible and clean.
- Social equity and quality of life move ahead as one due to general access to public and community assets which direct civic empowerment. Social inclusion has to be promoted since prosperity feeds on equity.
- Urban areas highly contribute to national productivity. Crowded city economies make cities more competitive and benefit overcrowded zones. City productivity soars, becomes more competitive, innovative, and prosperous.

**The challenge for prosperity in Mexican cities**

Mexico is a country that definitely needs to thrive. Being part of the Prosperous City Initiative U.N.-Habitat is an alternative to be chosen and taken individually by cities. Despite several Mexican cities being able to integrate to the group of Prosperous Cities, and many more are half way through the process, the process is still slow and has several flaws that shall be assisted in a prompt and efficient way.

I will now describe the case in Villa Corregidora County, in the state of Queretaro, Mexico. This city was granted the Prosperous City certificate by U.N. Habitat. In one of the many tours I take around the city, I learned that this county was favoured by the city with nearly one kilometre of urbanization. However, sewage pipes were not installed, and people continue to use latrines. Furthermore, running water pipes were not supplied either; everyone takes water from the same community line to be able to obtain a share of the vital liquid. There are many points that do not obey the Initiative; it is true that this is only the first stage, but the reality of a prosperous city is nothing but a brush stroke; better actual quality of life for the dwellers is yet to be accomplished.

The biggest challenge posed to cities is to improve the quality of life for urban citizens by allowing their actual worries to be part of strategic development. In the Worldwide City State Report 2013, regarding the topic Prosperity in Cities, several results were found. Two of them are to be shown in this study-work:

- “Public administrations, generally speaking, are inefficient; they offer scarce impulse to quality of life improvement. It also unveiled bad financial management, undertrained personnel, and lack of interest by politicians” (UN-Habitat 2013, p. 76).
- “Public administrations prioritize easily noticeable elements in search of better quality of life such as city parks, clean sidewalks, health clinics, spaces for leisure, art, and culture. It states that even though prosperity can’t be implemented thoroughly, working on better quality of life is the threshold to prosperity” (UN-Habitat 2013, p. 77).
Analysis of perspectives in Mexican urban advent

U.N. Habitat approves of the city being turned into a platform of solutions to confront crisis in a pragmatic and efficient manner. It claims that cities may react by empowering social and political bonds, hence, providing bottom up solutions. Those cities are in good position to impulse production in actual local economy sectors, to generate employment and incomes, those cities are fundamental in guiding nations to more inclusive, productive, creative, and sustainable paths. In other words, it acknowledges the city as a structural element of adjustment, alike the World Bank. Simply put, both of those ideas, show the same prototypicality. Reflecting in this study-work, the Prosperous City Initiative U.N.-Habitat is exactly the same speech as one of the New Scenarios of City Integral Development.

In Chart 1, the approach of challenges and realities toward prosperous Mexican cities is shown. Several points of those characteristics corresponding both of those perspectives analyzed in this study, Neoliberalism and City, and Prosperous City Initiative U.N.-Habitat, were selected. Several of those were planted as challenges, and reflected as realities in Mexican cities; some of those considerations were also accounted for from a personal perspective, as a result of this research paper.

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Realities</th>
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<tr>
<td>Governments shall acknowledge the importance and potential of human intervention</td>
<td>Support and acknowledgment of human intervention are nearly none</td>
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<tr>
<td>Environmental sustainability</td>
<td>The sustainability culture has been initiated but the process is slow, especially about regulations</td>
</tr>
<tr>
<td>The different factors that determine city growth, strategies, human capital, corporations, investment, education, and political forces, have to be considered</td>
<td>In public politics, holistic consideration of factors that determine growth is scarce. Some of them are looked into but others are ignored</td>
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<td>If urbanization is planned and well managed, prosperity distribution will move forward</td>
<td>Distribution mechanisms for prosperity are slow. There isn’t enough experience and there is also lack of interest to improve</td>
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<tr>
<td>Good governance and management</td>
<td>We intend to work on it but we are also a nation with high levels of corruption</td>
</tr>
<tr>
<td>Access to public and community assets</td>
<td>Its promotion has been initiated but I assume, based mostly in embedded bad practices, that public space heads toward civic empowerment</td>
</tr>
<tr>
<td>Urban management and planning as mechanisms to the creation of favorable surroundings</td>
<td>City management heads to the creation of favorable surroundings but politicians are afraid of the unknown</td>
</tr>
<tr>
<td>No city can claim to be prosperous when a big percentage of its population live in extreme poverty</td>
<td>Mexican cities claim to be prosperous and boast high quality of life even though there are more than 53.3 million poor people</td>
</tr>
<tr>
<td>The participation of civilians empowers communities and allows citizens to be part of development</td>
<td>Governments fear the empowering of citizens. There is lack of awareness toward social empowerment</td>
</tr>
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<td>The implementation of systems that guarantee equality of opportunities for everyone, especially for the most vulnerable</td>
<td>The implementation of opportunities for everyone is slow. The push of the vulnerable population is not taken advantage of.</td>
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<tr>
<td>Cities with business atmospheres and entrepreneurial favorable cultures are more likely to be prosperous</td>
<td>The promotion for entrepreneurial culture is scarce and weak. Most of the support goes to big companies</td>
</tr>
<tr>
<td>Poverty. There are over 53.3 million poor people in Mexico</td>
<td>The seriousness of the problem is denied, there are high levels of inequity and poverty</td>
</tr>
<tr>
<td>As far as economic development is concerned, we need to find better support and to make the city more socially inclusive</td>
<td>Many cities are now competing and looking for better support, and others are trying to become more inclusive. But many others are not.</td>
</tr>
<tr>
<td>Crisis. Mexico has been applying neoliberal economic reforms since 1982</td>
<td>The biggest problem is the enormous inequality in wealth distribution</td>
</tr>
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Working on infrastructure improvement | Governments are concerned, but unfortunately, low quality due to corruption is often present
---|---
To promote better quality of life by minimizing bad financial management. To train personnel and to push political parties to get interested | Inefficiency in public administration
Increase on productivity | This is one of the most relevant aspects to Mexican cities; they worry about it so much that the holistic vision of welfare is neglected and doesn’t reach all of us

**CHART 1**: Challenges and facts toward the prosperous city in Mexico (Prepared 2014).

**CONCLUSION**

Only when governments manage cities holistically, getting rid of inefficient old practices, and only when the city finds equilibrium, reducing energetic expenses and ecological decay, conciliating productive and social scopes, only when urban powers implement opportunities for everyone, allowing the empowerment of citizens, and when poverty stops being a secondary issue, when strategies aimed to face the challenge of inclusive prosperity are linked transversally and interdisciplinary, only then, an innovative and prosperous city will flourish. The cities with the best practices and performances not only get their strengths exclusively from their condition as world economic powers, or from their sophisticated structure, but also from their capability to improve the quality of life for their citizens.

In regards to these issues, the Mexican government has made important decisions that, although a bit drastic, shall strengthen life conditions for its people. We are now going through a series of reforms that are expected to open the doors of competition, as a nation before the world. Among these, are internal revenue, labor, energetic, and of course, educational reforms. Mexican cities in search for prosperity shall consider and work on international dimensions to accomplish access to the economic resources that control development. Indeed, Mexico has accepted the challenge to change, nevertheless, the new reforms proposed by the government might not achieve the change unilaterally; the change also implies harmony among these dimensions and excellence in the conduction of public politics.

Finally, after confronting those two perspectives, resulting in the approach of challenges and realities toward the prosperous city in Mexico, and after 30 years of an unequal developmental model, and also before a mere initiative disguised as equity, the question arises… is the Prosperous City Initiative really convenient to Mexico? The answer is simple. We must think in global terms but endeavor locally. If public politics in developmental phenomena and urban transformation are holistically managed, if we bind developmental strategies transversally and in an inclusive and creative way, but not just to follow indicators but also to strengthen the levels of life quality, with excellence and equity for all Mexicans alike, then, whatever we accomplish will be convenient to our nation.

**REFERENCES**


Mattongo, C et al., 2008. Ventuno parole per l’urbanistica, Crocci editore, Roma.


Osmot, A et al., 2002. La città inclusiva. Argomenti per la città dei PVS (paesi in via di sviluppo), Franco Angeli, Milano.


Trejo, MT., 2011. ‘Presentación ponencia “Pensar Global, Actual Local. Por una mejor calidad de vida en nuestras ciudades”’, Querétaro, México.

Trejo, MT., 2008. ‘Presentación ponencia “La pobreza, un reto inclusivo y sustentable”’, Noche sin Techo, Querétaro, México.
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