Visions for the Future of Housing Mega Cities
April 16-19, 2012 Istanbul Technical University

edited by

Oktay Ural
Muhammed Şahin
Derin Ural
The enclosed DVD-ROM provides the complete version of the papers presented during the XXXVIII IAHS World Congress.

Minimum Configuration

PC Pentium 2 350Mhz or more
512 MB RAM
DVD-ROM Player 4X
SVGA Monitor (800x600)
Windows™ 98, NT, 2000, XP, Vista, 7
Adobe Acrobat™ Reader 9
A special thanks to the following public and private bodies for sponsorship and generous support

Main Sponsor

Ağaoğlu
Yaşan Mimarları

Platinum Sponsors

ATA
ENKA
Soyak

Gold Sponsor

Enar
Engineers, Architects and Consultants

Silver Sponsors

KıSKA
Koray İnşaat Sanayi ve Ticaret A.Ş.
Yenigün
SuryaPı

Publishing Sponsor

CM
Congress Organizing Committee

Prof. Oktay Ural, President, IAHS
Prof. Muhammed Şahin, President, ITU
Prof. Derin Ural, Vice President, ITU (Chairperson)
Prof. Gülsün Sağlamer, ITU
Prof. Vitor Abrantes, University of Porto, Portugal
Prof. Luis Villegas, University of Cantabria, Spain
Prof. Antonio Frattari, University of Trento, Italy
Esq. Al Borvice, San Francisco, USA
Prof. Vladimir Brezar, University of Lubjiana, Slovenia
Prof. Qian Shi, Tongji University, Shanghai, China
Prof. Ahmet Sağlamer, ITU
Dr. Rossano Albatici, Trento, Italy
Kaya Tuncer, Los Angeles, USA
Doğan Hasol, Istanbul, Turkey
Prof. Gaye Onursal Denli, ITU
Prof. Mehmet Inan, Portland, Oregon, USA
Prof. Fernando Tinoco, Miami, USA
Prof. Subrata Chattopadhyay, IIT, Kolkata
Prof. Amir Mirmiran, FIU, Miami, USA
Prof. Antonio Nanni, UM, Miami, USA
Prof. Antonio Tadeu, University of Coimbra, Portugal
Prof. Adel Hanna, Concordia University, Canada
Prof. Ahsen Özsoy, Vice President, ITU
Prof. Orhan Hachasanoğlu, ITU

Congress Local Committee

Dr. Esin Ergen, Congress Secretary, ITU
Sevgi Ural, Advisor to the President, ITU
Dr. Senem Deviren, Advisor to the President, ITU
Dr. Ozan Önder Özener, Advisor to the President, ITU
Dr. Berrak Teymur, Advisor to the President, ITU
Didem Yücel, Director, External Affairs, ITU
Tolga Özüdoğru, ITU
Mert Tolon, ITU
Zeynep Taşkın, ITU
Preface

The Proceedings for the “XXXVIII IAHS World Congress: Visions for the Future of Housing-Mega Cities” are intended to guide the participants through the various disciplines and perspectives, all of which are closely related and intertwined, in this multi and interdisciplinary study of Housing Science. We are happy to welcome so many valuable contributions from many countries of the world. This genuine interest emphasizes the significance of housing studies, demonstrating its importance as all families have hope and expectations to improve their habitat, and to maintain a better quality of life.

The sub-themes of the congress: innovative design; construction schemes; innovative financing systems; effective management for housing, allow the participants to address all pertinent subjects related to the main issues. There are almost three hundred manuscripts prepared by established world scientists and experts who create the most relevant documents.

The year 2012 has a special meaning for the IAHS - International Association for Housing Science, for this year marks the FORTIETH year of its founding. It was initiated at the campus of the University of Missouri, Rolla, in 1972. The IAHS Journey, since then, has been exciting and ever-growing. So far, world congresses have been held in 30 countries and IAHS has published thirty five volumes of Proceedings, including thousands of manuscripts. This is an accomplishment whose honor belongs to all of you, the IAHS family.
Istanbul, a historic city on two continents, welcomes you to her charms. It is a Mega-City facing all sorts of housing obstacles. As you visit, you will witness firsthand most housing issues on a living platform. We are certain it will be a most interesting and enlightening experience.

Once more, we welcome you to the XXXVIIIth IAHS Congress. We hope you will enjoy your dynamic visits and return with abundance of knowledge and fond memories.

Professor Oktay Ural, IAHS Founding President
Professor Muhammed Şahin, ITU President
Professor Derin Ural, Congress Chairperson
# Table of Contents

## Keynote Addresses

**Jorge A. Vanegas**
A Transdisciplinary, Transinstitutional, and Transnational Integrative Framework for High Quality and Performance, Affordable, and Sustainable Housing

**Gülsün Sağlamer**
Transformations of Istanbul: A Voyage from Past to Future

**Amir Mirmiran**
Housing in Mega cities - A Systems Engineering Approach

## Topic A

**Effective Management for Housing Projects**

- **N. Abdel-Kader and S. Ettouney**
Decrying Sensible Housing Developments – Recapitulating Incremental, Partially Completed Low-Cost Housing, Egypt; Decades Later

- **V. Abrantes and A. Araújo**
Assessment of Comfort Level and General Home Condition of the Public Housing Buildings Property of a Portuguese Council

- **A. O. Adunola**
Indoor Thermal Comfort Variations in Residential Buildings within Ibadan Metropolis, Nigeria

- **O. A. Alagbe and E. B. Aduwo**
Housing Transformation and Its Impact on Quality of Life of Residents: A Case Study of Federal Low Income Housing Estate, Ipeja, Lagos State
M. Anbarci, E. Manisali and Y. S. Türkan
A Market Research for the Identification of Funding Problems and Marketing Strategies in the Housing Sector

J.R. Aranda, F.J. Balbás, Mª C. Ruiz, I. Lombillo and N. Kata
Construction System of Traditional Building in Togo

M. Ö. Arığlu Salmona, N. Arığlu and S. B. Güler
The Analysis of the Preservation and Repair Processes of Wooden Structures within the Context of Sustainability

S. Assaf, M. A. Hassanain, A. Bubshait and M. Khaliluddin
Assessment of Construction Risks and Their Allocation in the Construction Industry

J.R. Aranda, F.J. Balbás, Mª C. Ruiz, I. Lombillo and N. Kata
Building in Developing Countries

R. A. Ben Hameda and R. T. Belgasem Dboba
Libyan Housing Standards and People with Disabilities: Towards an Inclusive Approach

R. P. Guimaraes and M. C. R. Carvalho
The Influence of Ceiling Height in Thermal Comfort of Buildings: A Case Study in Belo Horizonte, Brazil

S. Chattopadhyay, D. Pandit, S. S. Altaf, and A. Bhunia
An Investigation on Location Choice for Housing in Mining Towns: Case Study of Korba, India

A. Cilasun
Analysis of Energy Evaluation on Lighting Programs
<table>
<thead>
<tr>
<th>Author 1</th>
<th>Author 2</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. de Goicoechea de la Quadra-Salcedo</td>
<td></td>
<td>Recovery of Defense Towers Basque with Economic Use</td>
<td>19</td>
</tr>
<tr>
<td>A. S. Elnashai</td>
<td></td>
<td>Integrated and Interdisciplinary Earthquake Impact Assessment for</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mitigation, Response and Recovery</td>
<td></td>
</tr>
<tr>
<td>M. Ayhan, G. Güven, A. Erberik, Ö. Kurç and M. T. Birgönül</td>
<td></td>
<td>Determining the Requirements of Indoor Navigation during Emergency</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Response and Disaster Management</td>
<td></td>
</tr>
<tr>
<td>D. Erten</td>
<td></td>
<td>Recommendations to Promote Green Affordable Housing Policy in</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turkey</td>
<td></td>
</tr>
<tr>
<td>A. Estokova and M. Porhincak</td>
<td></td>
<td>Environmental Analysis of Building Materials of Dwelling Homes in</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slovak Republic – Case Study</td>
<td></td>
</tr>
<tr>
<td>I. Eziyi and A. Dolapo</td>
<td></td>
<td>An Assessment of the Quality of Life of Residents in Public Housing in</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ogun State, Nigeria</td>
<td></td>
</tr>
<tr>
<td>F. Farshad</td>
<td></td>
<td>Towards an Effective Housing Management: Public Participation</td>
<td>25</td>
</tr>
<tr>
<td>E. O. Fatoye and O. M. Jayeola</td>
<td></td>
<td>An Appraisal of Utilization and Satisfaction of Local Building Materialsfor Low Cost Housing in Nigeria</td>
<td>26</td>
</tr>
</tbody>
</table>
E. F. López
Technical and Economic Feasibility to Adapt Common Elements of Buildings to Accessibility Conditions: Existing Residential Buildings Susceptible of Reasonable Accommodation

M. P. Gatti
The Development of Mountain Landscapes While Safeguarding Their Basic Sustainability

K. Goss
US Federal Emergency Management Agency: Housing Disaster Victims, Temporarily and Permanently

E.O. Iben and D. Amole
An Assessment of Satisfaction with Life in Public Housing in Ogun State, Nigeria

A. O. Ilesanmi
Housing, Neighborhood Quality and Quality of Life in Public Housing in Lagos, Nigeria

A. O. Ilesanmi
Inadequate Housing, Unsafe Neighborhoods and Mental Health: A Psycho-architectural Perspective

S. Imam
Non Physical Research Methods and Design Proposals, In Redevelopment Projects

J. Estêvão and J. C. Lanzinha
Potential redevelopment of industrial buildings in the city of Covilhã, Portugal

G. Joana and L. João Carlos
Building Rehabilitation Works – Design, Compatibility and Different Intervention Perspectives
E. Ülkeryıldız, M. E. İlal and S. Kale
An Entropy-Based Model for Evaluating the Housing Design Performance

R. M. L. Kalil and A. Gelpi
Social Housing, Municipal Development and Urban Sustainability in the Southern Brazil

E. Kasapoğlu
Importance of Subcontractors for a Successful Sustainable Housing Construction

E. Krídlová Burdová and S. Vilčeková
Indicators Identifying and Weighting in Building Environmental Assessment System

M. Kusnir, P. Kapalo and Z. Vranayová
Photovoltaic System and Energetic Demands of the Administrative Building

C. T. Lekule
Individual Housing Provision

F. J. Lucas, J. C. Lanzinha, A. J. Roque and J. P. Gomes
CDW Management Systems Existing In Central Region of the Iberian Raia (Portugal-Spain)

J. J. Molwusa, M. M. Danielb and J. D. Dachollo
Re-thinking the Approaches to Mass Housing Delivery in Nigeria: Lessons from past Housing Programme Implementation

R. Montagna and R. M. Barboni
Street Crimes and Quality Of Life in the Neighborhoods

A. E. Öztemir, M. Z. Nevzat and İ. Bağman
Quality of Life for the Turkish Cypriots since British Colonization
E. Pani
The Evolutionary Dwelling as a Sustainable Strategy for Housing

G. Ferri, M. Moschini, A. S. Pavesi, F. Pinto
Innovative Solutions for Social Housing Policies in Metropolitan Area of Milan

A. Lucchini, T. Poli and R. Perego
Towards A User-Friendly Visual Representation Methodology of Quality to Compare Alternative Envelope/Service Systems or Integrated Building Systems

A.F. Ramos and A.R. Mendes da Silva
The Life Cycle Analysis within the Evaluation Systems of Sustainability

B. Rangel, V. Abrantes, B. Alves and A. Faria
Integrated Project for Progressive Housing in 21st Century

Q. Shi and L. Zhou
Next Challenge of Sustainable Housing Construction: Evidence from China

S. Silva, P. Silva, M. Almeida and L. Bragança
IAQ Analysis of Portuguese Residential Buildings

A. Soeiro
Knowledge Management for SMEs about Building Rehabilitation

P. Stouten
Features of Sustainable Urban Renewal Programs

M. Tolon and D. Ural
Use of Artificial Intelligence Algorithm in Housing Projects Efficiency Decisions
M. Tolon and F. E. Çağal
Energy Efficiency at Houses Based on Artificial Intelligence Algorithm 57

Ş. S. Türk
Applicability of Inclusionary Housing in Developing Countries: Thinking on Istanbul 58

A. Kazaz¹, B. Soycopur², B. Er³ and S. Ulubeyli⁴
Adaptation of Quality Function Deployment Technique for the Construction Industry 59

L. Villegas, C. Carrasco, I. Lombillo, C. Liaño, A. de Hoyos and J. Balbás
The Big Crisis 2007-2010 of the Spanish Construction Sector 60

R. Vrijhoef
Effective Management of Housing Projects in the Netherlands through Supply Chain Integration and Collaboration Strategies 61

R. Zengel and I. Kaya
New Housing Provisions In Turkey as a Developing Country: Case of Ankara Angora Houses 62

TOPIC B

Innovative Design 63

A. O. Adunola
Housing and Environmental Problems in Urban Central Areas: Case Study of Ile-Ife, Nigeria 65

R. Hassan and M. Agguor
Towards the Nano Echo Space 66
G. Agostinelli, C. Talamo and G. Paganin
Changing Habit: A Low Impact System for Temporary Constructions

K. G. Ahmed
Current New Designs of Low Income Public Housing in Cairo: What Has Been Learnt From the Failure of the Past Experiences?

K. A. Alangoya
Suburbs: Chances for Mega Cities

R. Albatici, E. Resenterra and A. Piffer
Parametric Analysis of the Acoustic Performances of Wooden Buildings

M. H. Al-Jawadi and K. F. Al-Daudi
The Effect of Window Distribution on the Visual Illusion of Changing Space Areas in Housing Projects

M. Haider Al-Jawadi and J. A. Al-Sudany
Dome Geometrical Shapes Ideality in Thermal Performance

B. Ş. Altan and S. Meydan
Bayburt Stone: A Decorative External Cover for Buildings with Insulation and Passive Cooling Features

S. Amini, Y. Rafiei and S. M. H. Ayatollahi
Change of a Traditional Kitchen to a Student Lounge in a Courtyard House in Yazd

A. Aminuddin
Towards Sustainable Low Cost High Rise Housing: Case Studies in Kuala Lumpur, Malaysia

M. Amjad and SH. Satari
Surveying the Sustainability Principles in Designing Iranian Traditional Houses
A. M. Nwabueze
Affordability of Masses Houses in Nigeria: Local and Modern Hybrid Option

J. António, A. Tadeu and F. Pedro
Characterization of ICB hangers for Use in Suspended Acoustic Ceilings

J. Ascensão and V. Abrantes
Social Housing Rehabilitation of Portuguese Modern Movement and the Quarter of Bairro da Caixa Têxtil

Z. Aslay and D. Ural
Underground Space Use in Mega-Cities

N. Asoobar
Design Approaches for the Conversion of Historic Residential Buildings

G. Ballice and B. Hancl
Sustainable Kitchen Design

P. Bamberg, P. M. A. Castro, C. C. Ribeiro, J.M. Flor and F.A. Santos
Innovative Sustainable Residential Building Design in Brazil

C. Barlow, C. Abbott and B. Ozorhon
The Code for Sustainable Homes: Innovation and Regulation in UK Housing Development

S. S. Bateni and S. M. H Ayatollahi
Thermal Comfort of Summer and Winter Sections of Double Court Yards (Narengestan court yard) Case Study: Yazd, Iran

B. Beler Baykal
Segregation of Domestic Wastewater Streams – Housing / Toilet as The Starting Point of Water Saving and Conservation
A. Bekkouche
Urban Agriculture as a Way to Supply the Urban Green Spaces Oran’s Study Case (Algeria)

S. Bilgen and M. Aksoy
Thoughts and Ideas on Ecological Sustainability and the Reflections on Architecture

S. Martín Blas
Social Housing in Great Metropolitan Areas: A New Methodology for Integrated Quality Evaluation and Comparison

D. Bozsaky
Thermodynamic Tests with a New Kind of Thermal Insulation Material from Cornstalk

V. Brezar
The Future of Urban Dwelling Design

A. Briga-Sá, A. Paiva and J. Boaventura-Cunha
Contribution of the Trombe Wall to Sustainable Buildings: Experimental Work

S. M. Husain Bukhary
Re-Designing Future of Megacity Dhaka

C. Cachadinha and J. Pedro
Characteristics of an Age-Friendly Neighborhood Built Environment: Comparing Age-Friendly Community Models

R. Caponetto
Technological implementation and management innovation in self-building practice

M. Cavique and A. Gonçalves-Coelho
Using Axiomatic Design Theory to Help Implementing the 2010 Epbd
Y. Chen, T. S. Ng, and J. M. W. Wong
The Contribution and Effectiveness of Carbon Footprint Evaluation in Building Environmental Assessment Tools in Hong Kong

C. A. Celik, E. Bozkurt, I. Kahraman, E. Alakavuk and E. Özmehtem
A Model for Producing Electricity for Housing Units Considering School Roofs

Ana-Maria Dabija
Thermal Rehabilitation of Mass Buildings in Romania Lessons learned

B. Daniotti
Service Life prediction for a Sustainable Housing Design and Management

R. Birchmore, K. Davies and R. Tait
Development of a Full-Scale Testing Facility for Evaluating Thermal Performance of Light Timber Framed Housing in New Zealand

R. T. Belgasem Dboba
On Informal Housing: The Case of Al-Khaleej Region in Libya

A. Delic, B. Kinci and B. Opalic
High Rise-High Density - Potential for the Future

Lj. Biondic and A. Delic
Contemporary Users - Contemporary Housing

A. S. Deviren
The Living Cores: Where Urban Architecture Meets Nature

D. Dewar
Housing as Human-Habitat: The Social Housing and Affordable Housing Sectors in South Africa
M. L. Trani and B. Bossi
A Construction Site "Master plan" for New Towns

Z. Versic, I. Muraj and S. Raic
Energy Efficiency Renovation on the Example of a Multi-Apartment Building in Trnsko, Zagreb, Croatia

S. Zaid Alkilani, J. Jupp and A. Sawhney
The Characteristics and Status of Developing Countries' Construction Industries: A Case Study for Jordan

A. Frattari and M. Dalprà and G. Salvaterra
The role of the General Contractor in Sustainable Green Buildings: the case study of two buildings in the LEED certification in Italy

Iraj E. Majzub
"Not Even a Crack" The Earthquake Resistive Qualities of Anis Zunuzi School in Haiti

TOPIC D
Innovative Financing Systems

A. Al- Ali Al-Nuaim
House Construction Financing for Citizens with Medium Income in Saudi Arabia

J. Armengot and F. Garcia Erviti
The Economic Value of Residential Land in Historical Areas: An Application of the Residual Method to the Secondary Market

K. Bala and M. Nuhu Madaki and S. Ahmad Bustani
An Evaluation of the Housing Finance under the Nigerian National Housing Policy
M. M. Daniel and R. J. Hunt
Nigerian Housing Question: Beyond the Market Solution 258

A. Propersi and G. Mastrilli and S. Gundes
Social Housing in Italy: State of the Art, Prospects and a Case Study 259

A. T. Özbakan and S. Kale
Hedonic House Pricing Models: A Meta-Analysis 260

C. Murphy
Sharing the Blame: Financial Innovation in the Repair of Leaking Buildings in New Zealand 261

B. Sidawi
The Low-Income Citizens' Satisfaction about the Lifelong Financial Support 262

A. J. F. Vaz
Price Formation and Real Estate Characteristics: Residential Real Estate, Lisbon – Portugal 263
Price Formation and Real Estate Characteristics:
Residential Real Estate, Lisbon – Portugal

A. J. F. Vaz

Department of Civil Engineering and Planning
Polytechnic Institute of Braganca, Braganca, Portugal
e-mail: jfv@ipb.pt

Key words: Real estate valuation; hedonic models; linear regression; factorial analysis; residential real estate characteristics; asset price formation.

Abstract
The discretionality and the appraisers' subjectivity that characterize traditional real estate valuation are still allowed to take part in the formation of the asset price even when respecting international standards (EVS, IVS) or Appraisal Institution's regulations (TEGOVA, RICS, etc.). The application of Econometric Methods to real estate valuation by the use of statistic procedures aims at the elimination of subjectivity on the appraisal process. On this study, Hedonic Models (Econometric Methods applied to Real Estate Appraisal) are used to determine the most important characteristics that define the multifamily residential real estate selling price and therefore to make estimations on real estate selling price (knowing the asset characteristics). Two different Statistical Techniques were used in order to compare the results: Multiple Linear Regression; and Factorial Analysis. These techniques were applied to a sample of 82 flats for sale located in Lisbon, Portugal. From the 15 studied characteristics, we conclude that the ones that determine/influence the most the asset price are: Area (m2); Nr. of Bathrooms; Privileged View; Nr. of Parking places. Using these 4 variables the asset's price estimation model obtained explains 80, 9% of the Real Estate selling Price.