

Hiroshima-Motomachi Housing Project - Study on Re-generation of a mass-Housing -

Seiji Sawada, Arch., Prof. Dr., Japanese Assoc. of Housing Revitalization
Tetsuji Saito, Arch. MA, Town Planner, City of Kashima, Ibaragi Prefecture

1. Abstract

The purpose of this project is to define various issues of re-generation of Mass-housing – with the reference “Motomachi-Housing estate”, the earliest “high-rise apartment” of Japan, and lead comprehensive solutions to execute.

This article consists of three parts, to explore the issues and the methods and ways to improve the built environment and living condition.

Part-1: Housing supply system development and Mass housing in Japan

Part-2: Hiroshima-Motomachi Housing – History and present situation

Part-3: Research and development of framework Regeneration project of Motomachi and surroundings - program proposal for the period 2020~2045

2. Introduction

1) Social development – housing and urban development – 1945 – 2010

Japanese building industry had made great effort for re-construction of cities and infrastructure until the mid-50s.*1, 2 Thereafter a new policy was introduced for rapid, effective planning, design and production of housing; Mass Housing system. These systems could supply middle-rise concrete, fire-resistant houses of standard units all over Japan. This duty has been carried out by the newly introduced Japan Housing Corporation, prefectural Housing Supply Corporations and local government’s housing bureaus. (Fig 1, 2)

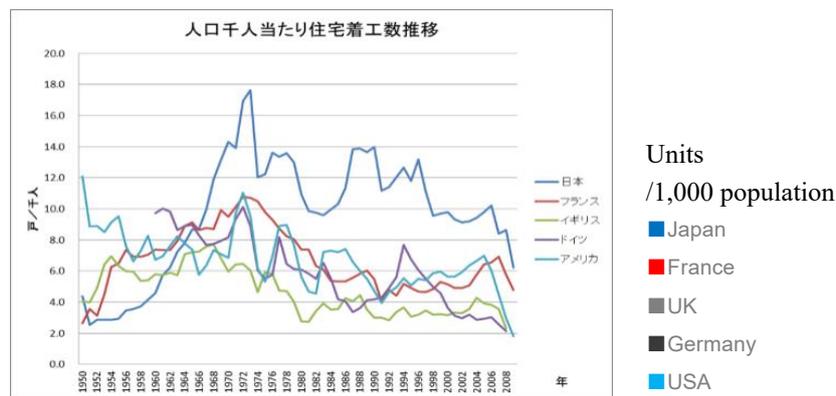


Fig 1 Development of housing supply 1950-2003 (Units/1,000 population)

2) Housing supply patterns in Japan – “Industrialization” of housing

In the beginning of 70es, the housing situation of Japan, “household per house unit” reached the enough level. (Fig.2) Along with the social growth, a new policy for housing was introduced, i.e. new industrialization development. *3 (Fig.3)

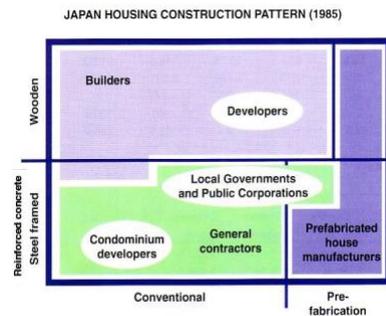


Fig 2 Housing supply patterns in Japan (1985, 20,000 Units)

Upper: Traditional Timber / Detached house

Lower: Reinforced concrete / Low- and mid-rise housing

■ right: Pre-Fab / Industrialized house

3) PILOT house projects and 3 high-rise housing model projects

The “Support/Skelton-Infill” concept have been tried in Japan since 60s, so as to inherit the traditional component unit system. In response to Open Building development in Europe, intensive R&D and trials projects – PILOT house projects – were done by public housing corporations and major private developers. Among those, NEXT21 was challenging and appealing.*5 (Fig 3)



Fig 3 NEXT21 experiment project of Osaka Gas Co., Osaka (2000 ~)

3. Development of Motomachi housing

1) Location – Hiroshima Central Park and the housing

At the west shore of Ohta river, two housing estates, Moto-machi and Cho-juen were built in 1970, in almost same shape. The Ohta River in the west, the Chojuen along the shore the Motomachi between the Ohta River and the castle. xx-1, -2

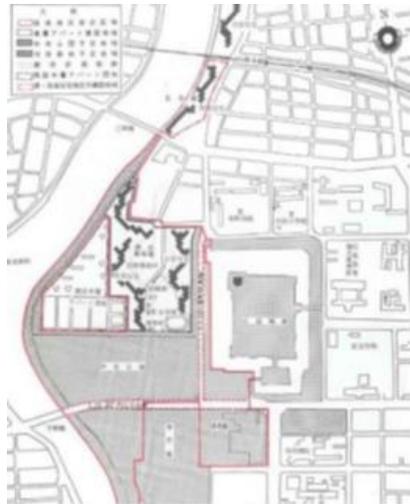


Fig 4 Hiroshima Central Park

	Centralization to Kyoto
1600	Hiroshima Castle founded
Edo Period	Battle of Sekigahara, Feudal times
Meiji Period	1868 Opening of Japan, Meiji Restoration
Taisho Period	1911 Westernization, Development of Cities
BAUSHAUS	1918
Showa Period	1926 World War I, World War II
End of the War	1945 Hiroshima Atom Bomb
Reconstruction	Reconstruction Time
1960s	Social Growth, Mass Housing Supply
1970s	Development of Motomachi-Housing Wealthy Society, Infrastructure Development
1980s	No Growth Age

Fig 5 History of Hiroshima

2) Hiroshima-Motonachi housing estate

Motomachi alone contains ca. 3000 units, 1,390 people per 1 ha-density. Most buildings are 20 floors high, designed and built based on “Open Building” concept; i. e. mega-frame and house, balcony and storage units. Standardization realized a variety of house units, zig-zag wall of homes are in an affordable distance.

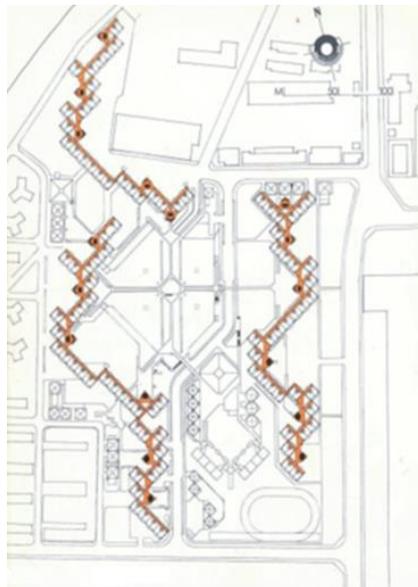


Fig 6: Motomachi high-rise housing estate – House layout, zig-zag Facade

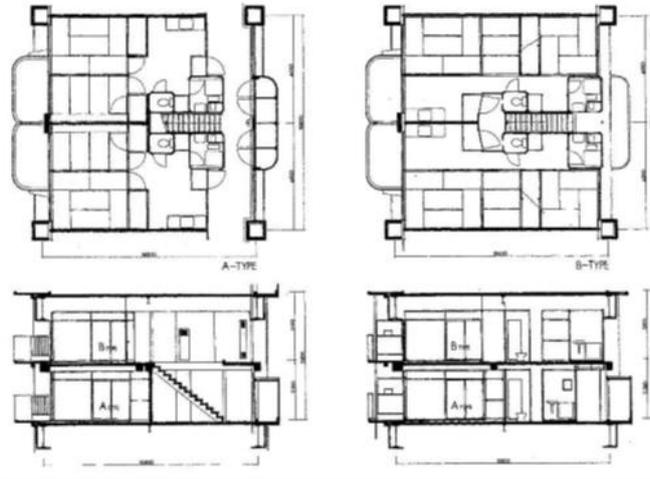


Fig 7 House units, two standard units in a floor, skip access from corridor

4. Regeneration Study - Urban Mobility

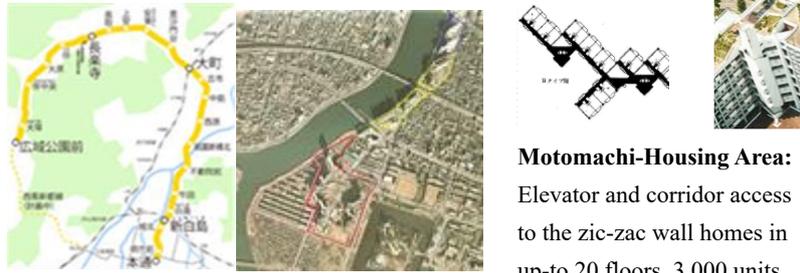


Fig 8 Motomachi: Southern view – Elementary school, shopping center

5. Regeneration Study - Urban Mobility, Energy Issues

1) Urban Mobility and Motomachi-Area Mobility

Due to rapid urban development in the city area, specifically thanks to Shin-Kansen (High Speed Train), JR regional railway, tram, subway and Astram systems, the surroundings of Central Park area have grown in terms of buildings, in higher and higher density. *4, *6, *7 (Fig 9)

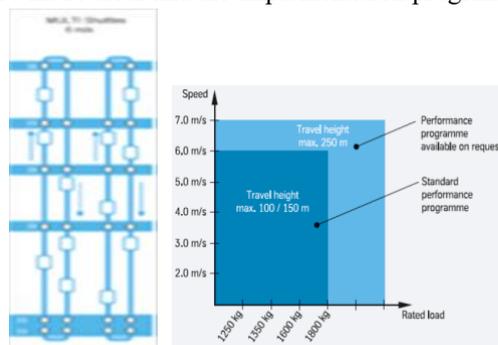


Motomachi-Housing Area:
 Elevator and corridor access
 to the zic-zac wall homes in
 up-to 20 floors, 3,000 units

Fig 9 Hiroshima City- and Regional Transportation, Central Park Area

2) Elevator system renovation

An advanced 3-D mobility system is ready to install in the building of Motomachi housing estate. Within the Mobility Study, its feasibility should be made clear and the implementation program is to be proposed. *10



Lope-less multi-cabin elevator e.g. can serve more passengers, less energy consuming mobility. Improvement of mobility will contribute to comfortable life for senior people.

Fig 10 An example of the advanced elevator (MULTI of ThyssenKrupp AG)

3) Energy Study - Urban Solar Decathlon - and Eco-Factory

Motomachi together with Chojuen would compose a powerful solar energy station and waste process factory very easily. That effort should be supported by the Solar Decathlon Community. *8, *9 (Fig 11)

Urban Solar Decathlon

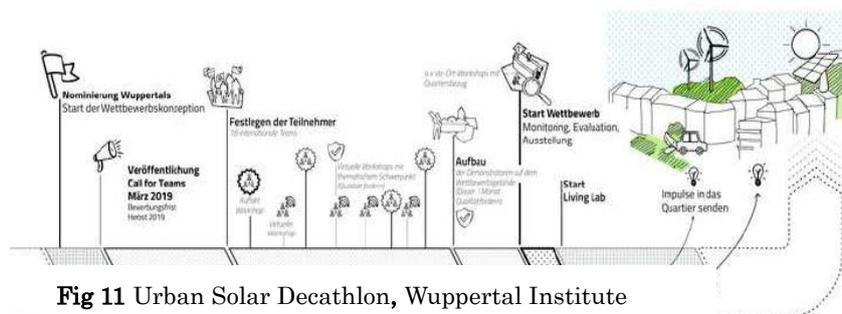


Fig 11 Urban Solar Decathlon, Wuppertal Institute

6. Conclusion – Re-generation should be proceeded by four Studies

Each study can be planned and executed individually, but the results are evaluated by the criteria of living functionality, space/built environment use, life time, facility management, energy consumption. The solution finding should be done by competition procedures, including international participants.

High level specialists' collaboration, e.g. with a wide and longterm perspective of town development history, such as that from the Visitor / R&D Center of White City, Tel Aviv, would contribute to handle the central issue of this project: *4, *6, *7, *8 (Fig 12)

URBAN MOBILITY STUDY	SUPPORT/SKELTON INFILL TUDY
District / Tissue, Skelton, Infill-Level	Tissue, Skelton, Infill-Level
<ul style="list-style-type: none"> ➤ Regional, Areal transportation services ➤ Goods delivery system (Maas) ➤ Elevator , ex. MULTI-system 	<ul style="list-style-type: none"> ➤ Mega-Flame & Skelton: House unit types ➤ House unit, balcony unit, storage ➤ Roof top space and Piloti space
Urban Built Natural	Environment Environment
ECO SYSTEM STUDY	INCLUSIVE COMMUNITY STUDY
Tissue, Skelton, Infill-Level	District / Tissue, Skelton, Level
<ul style="list-style-type: none"> ➤ Smart energy systems ➤ Solar, wind and renewable energy ➤ Green infrastructure 	<ul style="list-style-type: none"> ➤ Multi-cultural inclusion ➤ Generation disparity ➤ Social disparity

Fig 12 Four Study Fields in the Re-generation Project

References:

- 01: Japanische Architektur Geschichte und Gegenwart, M. Speidel, Hatje, Stuttgart, 1983
- 02: The Construction and Culture of Architecture Today: A View from Japan, Y. Utida, Ichigaya Pub. 2002
- 03: Changing Construction Market of Japanese companies, Well-being through Construction, Seiji Sawada, 1994, Tekes, Finland
- 04: Open House International / Special Issue: Dessau Conference report, May 10 – 12 1999, Towards the refurbishment and renovation of large prefabricated housing estates in east and central Europe, CIB W104 and EXPO 2000 Sachsen-Anhalt
- 05: NEXT21 Project, DOMUS, No.891, Italy, Oct 1998, NEXT21 Project, GA, Japan,

- 06: Sustainable Urbanism and Beyond – Rethinking Cities for Future, edit. Tigran Haas, Rizzoli, 2012 / Part 7 Sustainable Spatial Geographies and Regional Cities / 7.5 Cultivating Built Environment, N. John Habraken, “Cultivating Built Environment
- 07: Machizukuri in a Sustainable Society – What is effective machizukuri in a globalizing society, Edit. Author Seiji Sawada, Marumo Co, 2015, A Report on an international Conference, Tokyo, Yokohama, Shiga, 2015
- 08: The 15th Symposium “Housing Regeneration (Danchisaisei)”, Yokohama, 17th Dec 2018, LD Journal No. 126(English / Japanese Report: www.danchisaisei.org/)
- 09: Revitalization of large Housing Estates in Central Europe, Seiji Sawada, NATUROPA, Council of Europe, 2001
- 10: Urban Mobility Forum, Sawada + NRW-J + TK-J, Nov. 2016, Meiji-University Shikonkan, (ThyssenKrupp AG Elevator Division, ThyssenKrupp Japan AG)
- xx: Documents on the survey about the housing and living since the building completion, in 1970, are all in Japanese and stored at those who executed these researches, and not published. Following reports are made available for our study.
- i: Survey on Motomachi Housing – Future Perspective, Nobuyuki Hirano et. al. 2014, Foundation Urban Housing
 - ii: Report on the Symposium “Motomachi High-Rise APARTMENT and Masato Ohtaka”, 2016, Edit.: K. Ishimaru, Authors: M. Fujimoto, H. Matsukuma