

# A Vision for Japanese Style Development

By Kikutake Kiyonori

I have dreams and aspirations for a modern urban development based on the philosophy behind traditional Japanese wooden buildings.

Throughout history, the Japanese people have had the attitude of renewing and recycling materials in order to make a sustainable living environment. This mentality has created a distinctive Japanese building style full of beauty and resourcefulness.

To make buildings that are renewable, the Japanese have invented a sophisticated method of assembling and disassembling parts which resulted in a building technology based on system science. This system indicated the order of construction and allowed for the ease of erecting and dismantling a building. A good example is seen in the Ise Shrine in Mie prefecture, which is a representative Shinto shrine of Japan that has been rebuilt every 20 years for the past 1,200 years. At the time of renewal, the existing Shrine is disassembled and transported to a different shrine to be reassembled and reused. The new Shrine is built to the original specifications with fresh timber on the site adjacent to where the former Ise Shrine once stood. Here, we see

sustainability accomplished through renewing and recycling, and I believe this thinking has contributed to nurturing the progress of civilization in Japan, resulting in many hybrid cultures.

Like the Ise Shrine, the traditional Japanese farmhouse is also embodied with dynamics that promote a regenerating environment where transformation is regularly occurring.

On a larger view, it is the landscape of the mountain forests and rice cultivating plains forming the granary of Japan and the rivers connecting them that form the image Japanese people have of their home village. Within this scenery, houses were made to blend in.

Rural housing in Japan has been strongly influenced by the natural environment and climatic conditions. Since Japan is geographically located in the temperate zone and is surrounded by seas, most of the country has a comfortable climate and enjoys the lovely changes of the four seasons. As in other parts of Asia, Japan, too, has an ample share of rainfall which averages approximately 1,500mm per year. Although spring and autumn are mild and comfortable, summer is harder to endure than the tropics with dramatic changes in humidity that can sometimes exceed

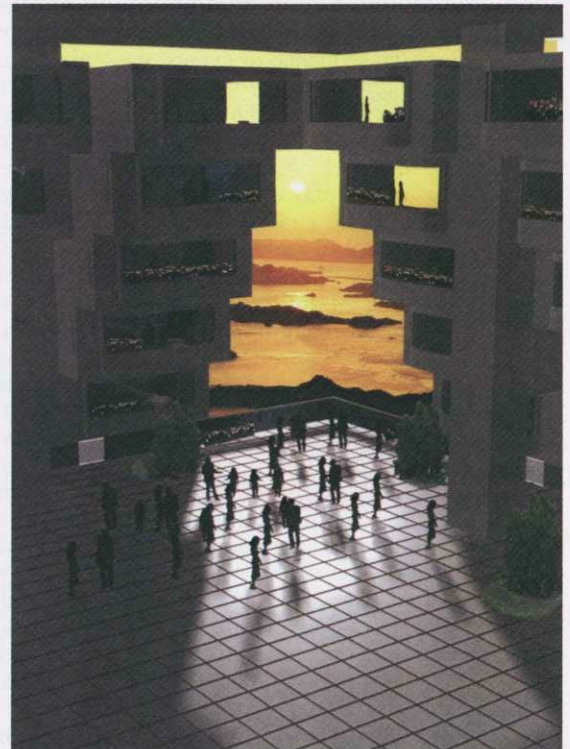


Photo : Kikutake Kiyonori

Aerial garden of the Tree Shaped Housing

Photo : Kikutake Kiyonori

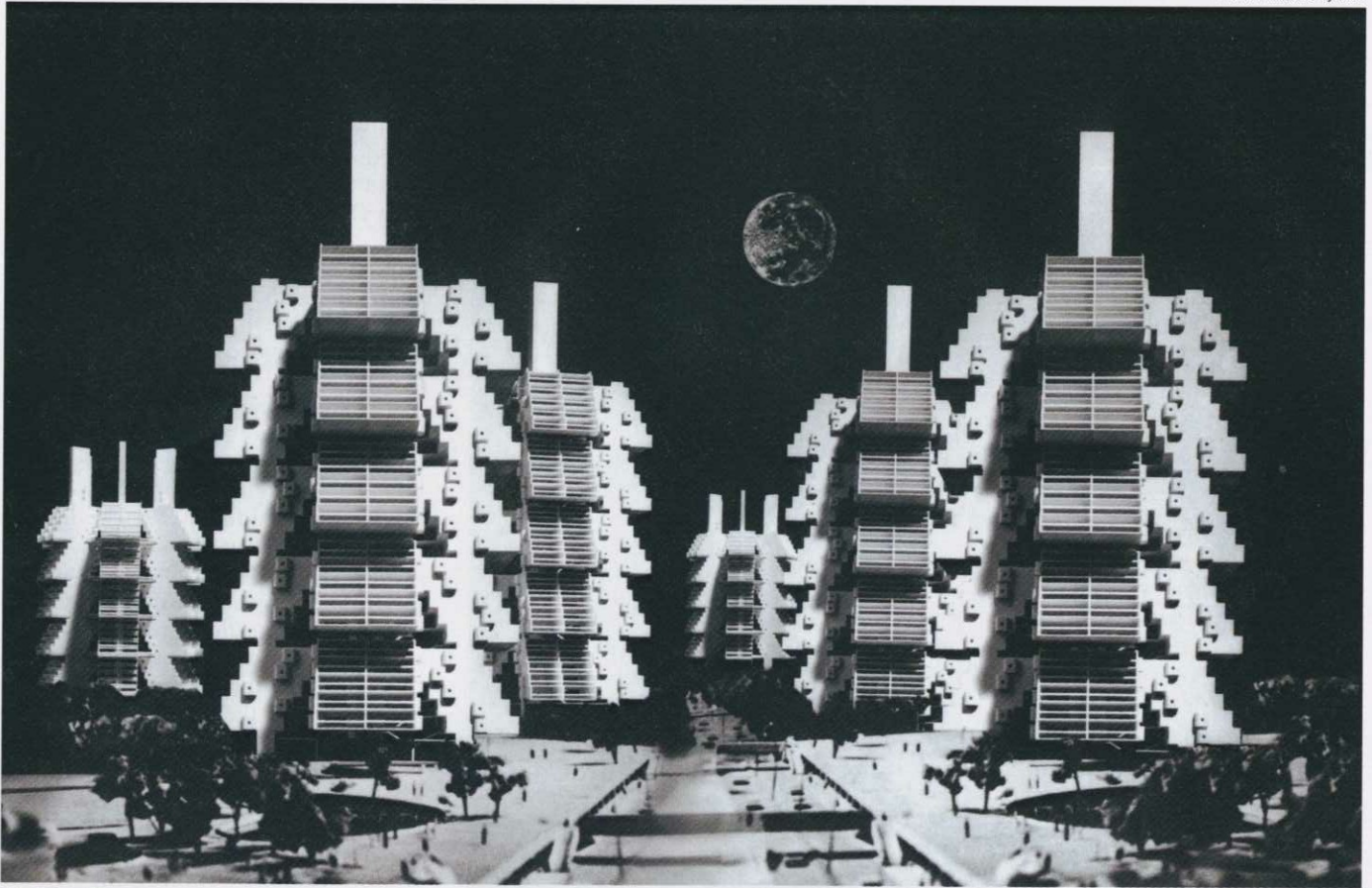


A traditional Japanese farmhouse with a storehouse

50% in one day. In some parts of Japan, winter feels even harsher than it does in the frigid zone. To adjust to these conditions, the traditional Japanese house was given a sharp slope on its straw thatched roof, both to run off the rain and to insulate the interior. In order to maintain freshness, the roof made of dried rice stalks was renewed almost every year in the autumn after the rice harvest. It was also a custom to replace the old *tatami* floor mats with new ones before the new year. After these renewal processes, the old roof and floor materials were recycled as fertilizers.

Because of the high humidity, and since humidity can only be alleviated by ventilation, the Japanese house was

Photo : Kikutake Kiyonori



The Tree Shaped Housing takes a form that harmonizes with nature

raised on posts for air circulation. This also gave visibility to the foundations, and when deterioration of the wood was detected, it was easily replaced. This practice has assured the strength of the structure on a long-term basis, and Japan's 1,500 years of traditional building history has produced some of the world's most advanced technologies in wooden frames, tie beams, and standardized modules on a human scale.

Another unique way in which the Japanese tried to control the temperature and humidity was by the use of a variety of sliding doors. To adjust the indoor conditions, the sliding doors such as the *shoji* (paper screen) which lets the light through, the *sudare* (reed screen) which lets the air through, the *fusuma* (non-transparent paper screen) and *itado* (non-transparent wooden screen) that block the sunlight and air circulation and the *koshido* (lattice screen) that was for security purposes, were used in layers. All the sliding

doors were unified in size at 90cm×180cm throughout the country, and since they can be easily removed from the rail, those that were not in use for seasonal reasons were kept in a storehouse. The unified size meant that they could be recycled and used in any other house. This versatility is also true for the tatami that were made to the same standard size as the sliding doors.

Traditionally, the Japanese people lived in *zashiki*, which is a large tatami room for flexible use, and used a *kura* or independent storehouse to keep various tools. The lifestyle involved foldable tables and bedding that could be put away when not in use, cooking utensils and dishes that could be stacked away neatly, and *kimono* clothing that folded flat for compact storage, among other fascinating features. During the day, items that were not in use were stored away tidily, creating an open space in the living room area. At night, the space could be sectioned with

sliding doors for different uses and needs.

In the 20<sup>th</sup> century, however, and especially since World War II, Japan was rapidly influenced by European and American architecture, and dramatic changes took place, most significantly within the cities. The rapid urbanization of the population and mass construction of apartment housing and high rise offices have changed the farmhouse and townhouse environment at a single stroke. Today, we have still not arrived at a Japanese style of urban housing. However, my feeling is that, if openness and flexibility were possible in wooden architecture, and if people were comfortable in such buildings, we should attempt to do something similar in modern architecture with steel, glass and concrete, and use these materials in renewable, reusable and flexible ways. With this being said, I would like to introduce two of my ideas towards a more dynamic man-made

Photo : Satoru Mishima (Nikkei BP Inc.)



The Sofitel Hotel Tokyo stands in a corner of Ueno Park

environment based on the renewing or “transforming” nature found in traditional buildings.

The Tree Shaped Housing was my attempt to design a multiple housing complex having elements of a traditional Japanese house. I believe that buildings should take a form that harmonizes with nature. The building, therefore, was shaped like a fir tree. This form made a lot of sense for it allowed the maximum amount of sunshine and natural ventilation for all the units. The cross shape of each floor was particularly important for natural ventilation, an element inherent in traditional housing.

In 1965, the Tree Shaped Housing

concept was proposed to the government of the suburban city of Machida in Tokyo. The site was in a beautiful area surrounded by forests and I was eager to design open style housing that would blend in with the natural surroundings. I also wanted to prove the possibility of carrying on a traditional Japanese lifestyle even in an apartment housing complex by creating a wooden interior and making extensive use of sliding doors. The units were fitted with tatami to permit flexible use of the rooms. Since the traditional size of a Japanese community was about 30 houses, and this fostered a shared awareness and sense of being a village, I decided to make an aerial garden on

every fourth floor, enclosing the atrium with 32 apartments. This height was based on a psychological study which found that children who lived above the fifth floor would mainly watch when they saw other children playing on the ground level, as opposed to those living below the fifth floor who went outside and joined in. I gave consideration to having flower beds for gardening, and placing slides, sandboxes and pools so that children can play “outside.” I also designed a glass greenhouse shield to block the cold north-west winds in the winter. At night, illumination would brighten the garden area. The idea of installing aerial gardens for the apartment residents was a unique undertaking in those days. But in terms of disaster prevention, the gardens would be useful in times of fires as well as earthquakes, and the natural ventilation going through the gardens also meant energy conservation by reducing the need for air conditioning. As for the kitchens and bathrooms, I fitted each residence with the most up-to-date, popular mass-produced units selectable by the residents, making the system replaceable when new models became available. Although this project was not pursued by the city of Machida, the ideas studied for the Tree Shaped Housing are reflected in the Sofitel Hotel Tokyo, which stands today in a corner of Ueno Park in the heart of Tokyo.

Another urban development project I have been studying is the concept of the Marine City. Although my earliest conception goes back to the mid-1950s, I first presented my Marine City sketches at the Modern Arts Museum in New York in 1960. For over half a century now, I have been conducting research and studies on this subject.

Japan is an island nation with approximately 4,000km of coastline. Some beaches are flanked with wind-breaking pine trees, creating very beautiful coastal landscapes. Other coastal areas are used for fishing purposes, but amendments to legislation in 2002 stipulated the development of the coast not only for fishing but also for leisure and sports. Development of coastal cities is

Photo : Okinawa Kokusai Kaiyo Hakurankai Kyokai (Association for the Expo '75)



*The Aquapolis, the world's first floating pavilion, was built for the Okinawa Ocean Expo in 1975*

likely to make progress because of these amendments, and I believe that Japan is approaching a turning point from inland development to coastal urban development. On this front, Japan's highly developed shipbuilding industry will make a major contribution towards the emergence of more cities by the sea.

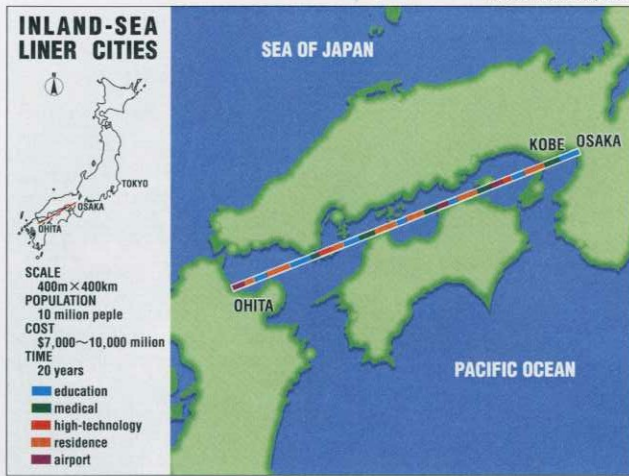
The unique features of coastal cities include such benefits as abundant common space that includes the sea and

varying scenery. Coastal cities can be built at less cost than building inland, and construction time can be shortened by capitalizing on marine transport. They have a large capacity for urban development, including extensions and enlargements, and the completed environment can be safe, comfortable and efficient, offering an abundance of natural features in contrast with the inland cities. These facts have been proven by the coastal cities of Côte d'Azur in the

Mediterranean and the charming marinas on the West Coast of the United States.

There is a considerable amount of debate as to what a Japanese style coastal city development should entail. Unfortunately, the ground in Japan is soft, and natural disasters, such as earthquakes and floods, are not uncommon. This is why we have been making our buildings sturdy with water-proofed underground structures. But

Photo: Kikutake Kiyonori



this fact makes me think that, with a change of perspective, it is possible to visualize them as having the same features as a floating structure. This means that these buildings can be set afloat with some adjustments. If we take the buildings and facilities on coastal land, float them on the adjacent sea and link them together, that would mean the realization of a Marine City. The space that would be created on land could be redeveloped to make new waterways and parks, and relieve the density tension. This thinking is what led me to propose the Inland Sea Linear City Project in 1993 during the International Macro Engineering Society Conference in Okayama prefecture when I happened to be the President of the Japanese branch.

In this presentation, I introduced my proposal for a 400km floating corridor off the Inland Sea of Japan, containing three airports, educational institutions from kindergartens to universities and life-long education centers, medical centers, an information technology industrial park, and residential areas with cultural and leisure facilities. Each floating block would be 100m<sup>2</sup> in size, which is the size of a city block in Buenos Aires, and the same size as the Aquapolis, which was the world's first floating pavilion built for the Okinawa Ocean Expo in 1975. For the Linear City project, I stated that we will obtain energy from nature, conduct communication via satellites, and supply water

from rainfall and desalinated seawater. For transportation, various vessels can be used both above and through underwater tunnels, and the integration of new technologies will help to realize the effective disposal of garbage, sewage and other types of waste. I envisioned the population of this marine city to almost equal the total population of the capital

city of Tokyo. The plan called for a 15-year construction period at a cost of ¥12 trillion. The propelling of the Linear City would have great significance for Japan's redevelopment. On water, the linking order and orientation of the floating blocks can be altered to best fulfill the needs of a vibrant city. Urban development of this scale will call for the integration of all Japanese industries, and such a project will surely contribute to long-term economic growth. The dynamics I see in creating this city come from the same philosophy behind the traditional Japanese way of maintaining the environment through regular renewal and regeneration. The moving and exchanging of facilities and equipment is nothing new given the traditional replacement system seen in Japanese wooden construction. Through the culmination of the latest available technologies, I believe that the Marine City will one day become a reality.

Some may feel that these ideas are limited to my personal imagination. Quite often, however, people's visions and long-term projects become a reality that can change the way of the world. For example, in the field of architecture, an American architect, Richard Buckminster Fuller (1895-1983), who had invented the Fuller Dome, had proposed covering a large portion of Manhattan with his Geodesic Dome for New York City (1961) to control the atmospheric conditions within. Rather

than each individual property being fitted with its own equipment, Fuller suggested a need for a common solution. Many considered this an outrageous idea at the time, but today many municipalities are faced with serious problems of air pollution and the heat island phenomenon. What Fuller tried to indicate has led to various experiments that continue to the present day, as represented by the Bio-Sphere Project in Arizona.

In 1914, a German architect, Bruno Taut (1880-1938), drew up the Glass Pavilion in Cologne. In the early 20<sup>th</sup> century, most considered this scheme unusual and felt there was little reason for its proliferation. Today, however, glass buildings are found everywhere and Taut is considered the father of glass architecture.

Another American architect, Louis Kahn (1901-1974), who is known for his design methodology, designed the National Assembly Hall in Bangladesh in 1983 with only natural ventilation and lighting in mind. This was during the height of the building equipment age and most new buildings were being equipped with the latest air conditioning systems. But Kahn reverted from this trend, and his proposal did not appear to embody the latest solution. Today, however, energy conservation is an agenda for governments worldwide, and we can say that Kahn's choice was sensible.

I firmly believe that the renewable and transformable environment realized by interchangeable parts and flexible functionality, as seen in traditional Japanese wooden architecture, can help to assure a sustainable and viable human environment. There are numerous lessons that we can learn from the traditional ways, and as a Japanese architect, I would like to continue reflecting this traditional wisdom in modern architecture. **JIT**

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