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Husui City

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1. Promothing a global environmental revolution by reassessing Husui Shiso, an ancient Oriental philosophy that views mankind and the environment as one.

Nature,the heavens, and man coexist in a delicate balance. Accordingly man must live in constant awareness of ki which is the flow of natural energy that emanates from heaven and earth. Ki can be represented by wind and water. It is also important to live in kyoku - a geographically ideal location that is suffused with ki.

The above concepts are fundamental to Husui Shiso, a philosophy which stresses the living character of all nature. Using Husui Method, optimal locations for development can be selected based on an understanding of how man and the environment interact. This Site Selection method is still practiced widely in East Asian countries.

Today's global environmental issues cannot be solved from an entirely Western ecological perspective, and conventional approaches to the environment must become more diversified. It is therefore important for us to reassess the ancient Husui Shiso philosophy.

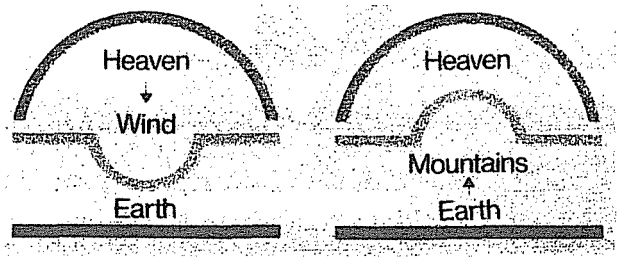

Fig 1. Relation of Heaven and Earth

2. Husui Shiso as symbiosis between man and nature

Based on Husui Shiso, the flow of the invisible ki can be evaluated based on visible phenomena such as wind and water. The philosophy also attempts to improve living a paces so that people can receive the benefits of a vital force - something that transcends the concept of natural energy . It is this force that ensures ensures environmental sustainability.

Husui Shiso incorporates the four points given below. Husui Shiso can be described as a philosophical system that deals comprehensively with the symbiosis between man and nature, whether viewed from the perspective of an entire city or of individual lives.

1) Environmental geology - assess environmental capacity based on geographical features.
2) Regional and urban planning study - identify appropriate sites and determine how land should be used.
3) Landscape architecture-create a landscape that takes advantage of the natural environment.
4) Public health study-demonstrate healthy living conditions suited to the specific region.

3 Evaluation standards for ki in Husui Shiso and their modern application

We are currently in need of technology that can be used to create modern social and economic system that can truly coexist with nature. This technology would be used to activate the vital force (or ki) in cities and regions based on Husui Shiso. In contrast to ecological technologies, which measure problems, Husui Method technology represents the importance of activating nature's power to recover the vital force.

Under Husui Shiso, nine elements (mountains, rivers, earth, soil, trees, sun, sky, streets, and direction) were the original standards used to evaluate environmental conditions. For example, a gentle and smooth mountain would endow people with ki and vitality, while a steep mountain would bring evil. Similarly, sites where rivers meander and flow gently or where the land is flat and surrounded by mountains and rivers are favorable environments, filled with vitality.

Using these evaluation standards which take into account the individuality of each region, we propose the application of urban ecological technologies on order to transform the evil into a vital force. This known today as Site Creation or the creation of kyoky.

When the nine factors listed above - from mountains to direction - are in good overall balance, then a city's self-sufficiency, sustainability and livability will be at a peak, and we will have built a Husui City, one that is suited to the global environment.

4 .A model of a Husui City designed to preserve the global environment

The Husui City we propose is not just a conceptual ideal; rather, it is a fully realizable model.

Here, we explore a case study of a model city and think about specific measures by which Husui shiso can be applied today.

Table 1. Location of the Husui City and other site condition

Location	Hills along a river in East Asia
Climate	Asian monsoon climate Average annual temperture 59°F, rainfall 55 inches／year Summer August／average air temperature 81°F, relative humidity 73% Winter January／average air temoerature 41°F, relative humidity 50%
Planned area	1,200 acres(500 ha)
Planned population	residential population of 50,000 working population of 60,000
Land use and facilities	Residential area (200 acres, 20,000 dwelling units); offices, research and development facilities (30 buildings, each 650,000 sq.ft.);commercial district (floor area 30,000 sq.ft.); urban research center for the global environment ; hospital ; schools (9 branches) ; parks (75 acres) ; green areas (230 acres) ; roads ; others.
Applied technologies	Urban ecologcal technologies indicated in the figure on the left is applied
Residents	Leaders in the field energy and resource management and other people with strong environmental awareness. Children will be brought up to respect the environment.

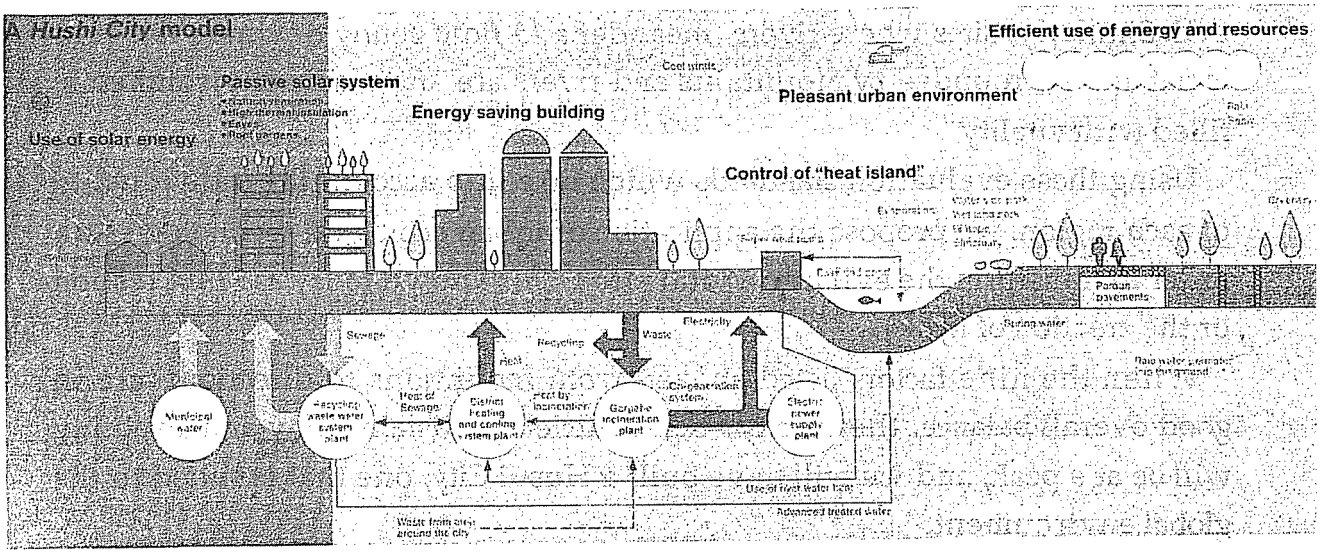

Fig 2. A model of HUSUI CITY

5.Principal land use policies for the Husui City model

1)Density of facilities and central area

●Lay out the facilities in an efficient yet spacious manner while varying the density of facilities (floor area ratio,population density)for different land uses.

●Create an attractive, lively, high - density core space in the town center.

●Locate the town center along the river in other to create a pleasant waterfront space.

2)Using water, flowers, and trees as environmental corridors

●Include streams and trees along major pedestrian paths to create corridors for a comfortable environment.

●Include an area that symbolizes the sense of community.

●Create streams, ponds and waterfalls using rain water and recycled waste water.

●Create a peaceful landscape rich in geographical variation while respecting the original landscape of the plan.

3)Transportation

●Restrict the amount of traffic by adopting a transportation plan.

●Build main roads underground and other roads with gentle curves.

4)Energy Supply and Application Systems of Husui City

●Electricity supply system

- Install solar power generation systems on the roof of single and multifamily homes to generate power.
- Photovoltaic surface area 3,600,000 sq.ft.; Maximum power generation 256 Mwhr／day

  Install systems that generate power by incinerating garbage at waste incineration facilities. Accept waste from areas around the city and use waste collected from the equivalent of three cities(population of 150,000) as an energy source.
- Waste equivalent to that of three cities; 330 tons／day
- Amount of power generated; 146 Mwhr／day
- Meet excess electricity requirements by supplying electricity from commercial power generation facilities outside the city.

●Heat supply system(air cooling and heating, hot water supply of Husui City)

- Establish a co-generation system that integrates a system that can generate power by incinerating garbage. Generate not only electricity but also the city's heat supply.

- Waste equivalent to that of three cities; 330 tons/day
- Amount of heat supplied; 364 Gcal/day
- There is a difference in temperature between the river water and the atmosphere. Therefore, use river water as cooling water during summer, and as water to generate the city's heat supply during winter.
- Air conditioning during summer; Amount of water taken in; 480,000 gallons/hr; temperature difference; 9°F ; amount of heat supplied; 216 Gcal/day
- Heating during winter; Amount of water taken in; 380,000 gallons/hr; temperature difference 5°F; amount of heat supplied; 104 Gcal/day
- Like river water, sewage is also used as cooling water and as a water source for the city's heat supply.
- Air conditioning during summer; Amount used; 4,900,000 gallons/day; temperature difference; 9 °F; amount of heat supplied; 185 Gcal/day
- Heating during winter; amount used; 4,900,000 gallons/day; temperature difference; 18°F; amount of heat supplied; 185 Gcal/day
- In case of the untapped energy above, using a high efficiency heat pump (super heat pump, COP*6-8), will reduce the energy consumed even more than will a normal heat pump (COP*3-4).

COP*; Coefficient of performance

●Architectural design using a passive solar system

- Reduce the air conditioning and heating load by taking the following steps; use high thermal insulation in buildings; install eaves; use natural ventilation; and plant trees on rooftops.
- 10% reduction in the air cooling load 50% reduction in the heating load
- Water circulation recycling system

(1) Recycling waste water system

- Advanced wastewater treatment is used as flush water for toilets and streams; 950,000 gallons/day
- By sending this water to the upper reaches, the environmental capacity of the river will increase; 2,000,000 gallons/day

(2) Rain water use system

- Increase the permeates into the ground with porous pavements.

6.Effects of Husui City

Fig.3 shows the quantitative effects of the model city where Husui Shiso concepts allow untapped energy to be used and the circulation of substances to be promoted in comparison with conventional urban planning.

It indicates that energy consumption can be reduced by an estimated 40% , air pollution by 70%, deterioration in water pollution by 45%, and water consumption by 30%.

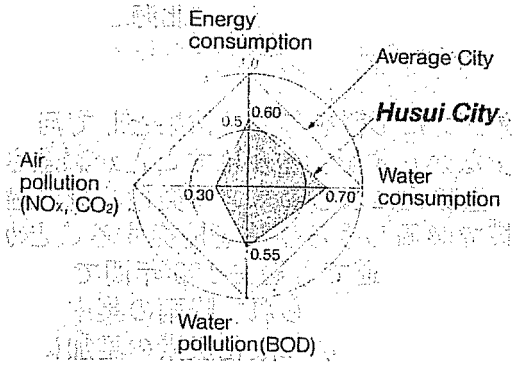

Fig.3 Comparison of Husui City and average city

It also shows that the city can be made more self-sufficient. The use of power generated by incinerating garbage and untapped energy in particular will significantly from commercial power generation facilities.

The use of urban ecological technologies is also expected to bring about the following qualitative improvements;

- Increase in the environmental capacity of rivers.
- Taking in cool winds from river during summer, and shutting out strong winds during winter.
- Creation of the environmental capacity of rivers.
- Proving people with comfort and security by a human scale design of townscape.

In a Husui City, people will be able to live a healthy life both mentally and physically.

Reference:

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