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## **Permaculture in Japan: Suitable for the Natural and Cultural Conditions of Japan**

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*[Submitted Paper]*

### **Introduction**

Before the massive introduction of Western civilization after the World War II, Japanese rural villages had self-sustainable systems suitable for each one's physical and cultural condition and enjoyed a life style harmonious with their natural environment. But the excessively rapid economical development and capitalization once admired as miracle by both western and oriental countries lead them to the disintegration and separated them from the natural system. As its result, on one hand, the rural villages have got underpopulated and the national food self-supply rate decreased to less than fifty percent in calorie consumption base and comparing to the early 1960's about fifteen percent of once productive land has been turned to residential area or just abandoned.

On the other hand, urbanization together with overpopulation causes the physical and metaphysical pollution. Living in the artificial and materialistic environment, suffering from air, water, food and some other pollutions, and exhausted by everyday competition, city dwellers feel bodily and mentally suffocated. The fact that all the newspapers and magazines are filled with articles concerning health or healing indicates their critical situation. Permaculture reminds us the critical value and importance of social and cultural system our ancestors had constructed on the basis of deep understanding of the relationship between nature and human activities in the context of sustainable human settlement. We don't retrospect the past with nostalgia but recognize the system as a prototype with which we can construct a totally new unit of sustainable society.

What we intend to do is to identify some crucial aspects of the human eco-system of rural villages still remaining self-sustainable and report some going-on movements of reconstructing self-sustainable societies on the basis of the integration of traditional wisdom and modern ecological recognition to contribute the further development of permaculture.

## Japanese rural villages, a model of self-sustainable human settlement

A Japanese traditional rural village had composed a “Human Life Ecosystem”, an entity of interactive relationships between natural environment and a human’s society where the latter was integrated in the former in a harmonious way as to be sustainable. In other words, a Japanese rural village developed as an universe consisting of three different spaces, such as cultivated, residential and natural.

A rural village, as the smallest unit of space where nature and human society co-exist, had been ecologically sustainable before the modernization. The import of resources from outside was minimum and the people had the life dependent on the sustainability of the regional resources such as microclimate, trees, soil and water. A regional and sustainable system had been developed on the basis of regional resources.

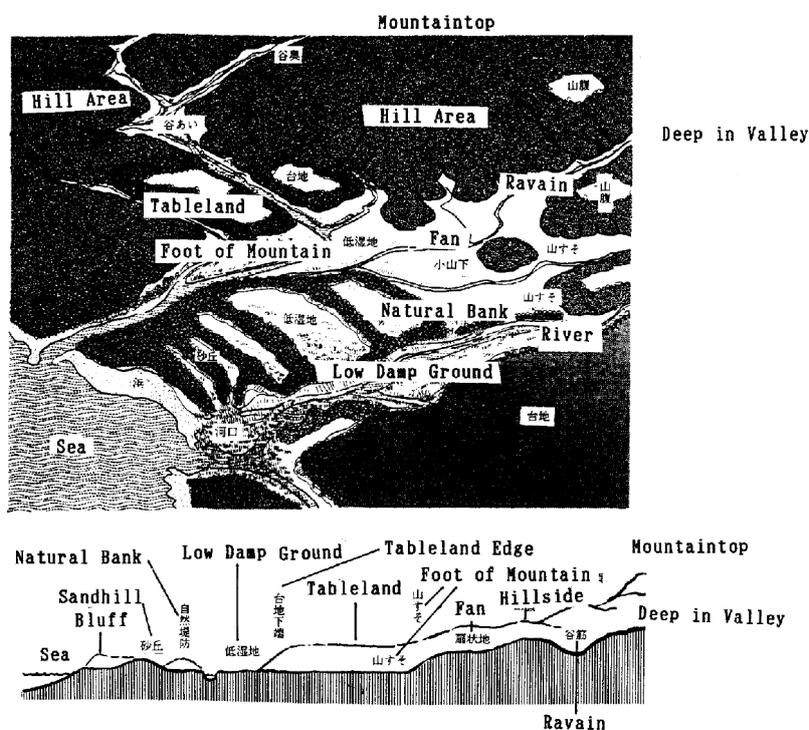
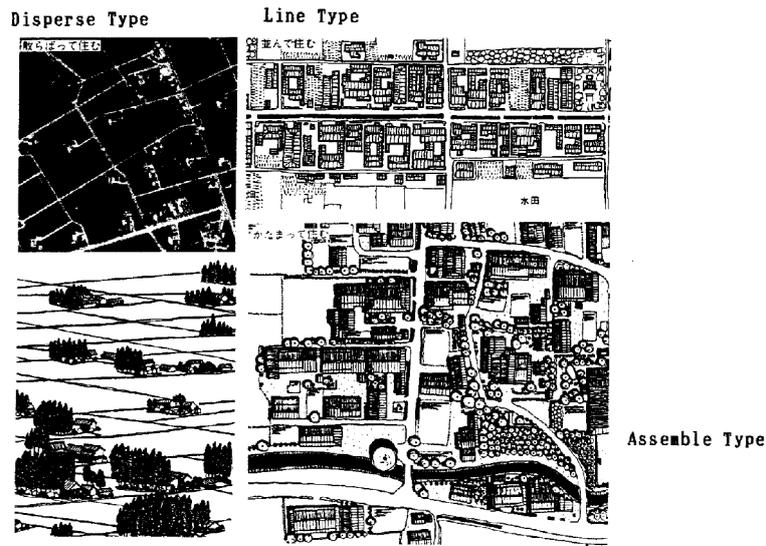


Figure 1: Traditional village location in Japan<sup>1</sup>

Figure 1 shows the location of village harmonized to geographical feature. Figure 2 shows three traditional and spatial village types. All the types have water area, natural area with small forest functioning as foodforest and windbreak, large forest, agriculture field and small agriculture field for self-supply. These systems have been maintained by many farmers for more than 300 years. The water around a village have used for both paddy field and household matter. In the small forest around a farmer’s house, leaves and branches have been used as compost and firewood. In village forest, every about twenty years, trees have cut for making charcoal or

<sup>1</sup> from Villages by Rural Planning Committee in Architectural Institute of Japan



**Figure 2:** Traditional types of village formation in Japan<sup>1</sup>



**Figure 3:** Disperse type village landscape

building material. A large forest behind villages functions as water storage, forest-foods, and spiritual area. Figure 3 shows these topological pattern.

### The principle of Japanese rural village structure

As well as the physical factors such as site, topography and climate, social and spiritual factors have crucial importance on the structure of rural villages. Some conceptual models explaining the structure of the villages have been proposed:

- A three dimensional model composed by the functional, social and conscious space.
- A hierarchical model composed by living, productive and conserved space.
- A mountain village model composed by residential area, village mountain area and undeveloped area. The model is similar to a settlement model based of “Feng Shui”.

The principles of Japanese rural village structure can be described as:

- *Zoning* – Residential zone, production zone, spiritual zone.
- *Linear structure* – Factors are related by linear infrastructure such as roads and rivers.

- *Similarity* – Similarity of living space.
- *Composition by subsystems* – Composed by subsystems based on lineage or spatial relationship.
- *Identified border* – The borders of rural villages are well identified by symbolized space.
- *Common space* – Community roads, shrines, community forests, commonly used forests.

## **The aspects to be considered to reconstruct self-sustainable rural villages**

### ***Natural environment***

In hilly areas, with which Japan is abound, we need to think of watershed as an important factor of the reconstruction project. Streams and rivers are the crucial factors to identify an area of ecological entity.

### ***Landscape***

Landscape is an interface of nature and human's activities where the relationships between the former and the latter are materialized. The similarity of Japanese rural villages is one of their characteristics.

### ***Social and cultural aspects***

Japanese rural societies was composed by small scale communities. There are about 140,000 rural village communities in Japan. To reconstruct Japanese rural villages as "Eco-village", the re-evaluation of the small communities as the body to control the relationships between nature and human is of necessity.

## **Various possibilities of "eco-village" in Japan**

### ***In urban areas***

Rural village located close to cities can make use of the both advantages of urban and rural area. In other words, in the villages, agricultural resources such as fields and experiences of working with nature are the important factors to improve the urban environmental situation. The mixture of urban facilities and rural environment can provide a model of reconstructing urban villages coexistent with agriculture.

### ***In rural areas***

In rural villages the sense of value have been diversified by the urbanization and the decrease of relative importance of agriculture in the rural life. To reactivate the villages the creation of their self-sufficiency in harmony with the natural environment is crucial. It will result in rendering the villages more attractive than urban areas.

### ***In mountainous areas***

The most important problem in mountain villages is depopulation. To resolve this problem, reorganization of the village structure on the basis of more active relationships with urban cities is vital and highly required. The advantages of living in mountain villages should be more fairly recognized and made use of to attract the people from urban areas. The reconstruction of villages should be based on the integrated project of forestry, agriculture and tourism.

## **The trials for sustainable societies**

### **The case of Yu-Ichi (Dream Market)**

Japanese agriculture is now at the edge of destruction and so are the rural villages. But here, the success of Kanayamacho Yu-ichi group indicates one direction Japanese agriculture should follow to keep its independency and one way to reconstruct a sustainable community.

#### ***The embarkment of Yu-Ichi***

Located in the north-east area of Yamagata Prefecture, Kanayama-cho has fostered forestry as its main industry and has been famous for Kanayama cedar trees. As for agriculture, rice has been its main crops for long time and they have grown vegetables in their kitchen garden for their own use.

In 1979, Yu-ichi originated on the concept of “ottai-nai (no waste in Japanese)”. A policy of cutting back the acreage under rice cultivation brought about the overproduction of vegetables for family use. JA (Japan Agriculture Association) Kanayama branch, therefore, opened a vegetable market to sell the surplus. About thirty farmers took part in the market and sold their vegetables.

As the shoppers were mostly housewives in the town, they felt ill at ease at first. They were too shy to sell their products face to face. This market was the origin of Yu-ichi named under Yu (evening in Japanese) and Ichi (market in Japanese) . As in the initial stage they sold surplus vegetables not standardized, there were some confusions of quality, quantity and price. A lot of vegetables were left unsold. In addition, the incomes earned in the market didn't deserve the labor they put there. More than half of the initial members gave up the market and just seven of them continued.

#### ***The process of development***

But the concept of Yu-ichi was appreciated and it had a chance to expand outside the town. In 1982 they opened a branch of Yu-ichi in Shinjo City next to their town. At first the market was opened by Mogami Branch of Yamagata Prefectural Economic Federation of Agricultural Cooperatives with the purpose of selling the products of JA branches in the area. But other branches soon gave up because of their insufficient supply system and only Yu-ichi could stand.

Yu-ichi opens every Friday in front of JA shop and has become the shop's good attraction. In 1986 when a new branch was initiated in Yamagata City , it opened irregularly and a research was done on vegetable consumption. Its result is that the consumers valued “safety”, “freshness” and “cheapness”, which are now recognized to be important criteria to evaluate foods. The members of Yu-ichi knew that they could meet these requirements and decided to open the market regularly.

In 1990, each of the members equipped processing facilities in their own home for the wintertime production. They produced processed rice foods and secured income in winter. Their slogan has been “Keep Going”, that is the key concept of Yu-ichi's success. It seems they have constructed an efficient system in the process of keeping Yu-ichi going.

### ***Toward sustainable agriculture***

In Yu-ichi, they sell more than 200 kinds of fresh and processed foods such as vegetables, mountain vegetables, flowers, fruits, processed rice foods, pickles, all of which they grow and process by themselves. Most of the fresh products are cultivated without or little pesticide and herbicide. They process foods in a traditional way and use no chemical. In other words, they respect the earth and value traditional culture they want to pass to the next generation. This will lead to a sustainable agriculture.

### ***Creative life creates the joy of life***

Yu-ichi also provides the chances of communication between producer and consumer. At the beginning Yu-ichi was the place to sell products. But in ten years, it turned the place of heartfelt communication and of selling dreams. Both money and the joy of mutual communication produced in Yu-ichi provide the members with a joy of life.

Another benefit Yu-ichi brought to the members is the joy of creating their own life. They make the plan and schedule of Yu-ichi, produce foods and sell the products. They are proud of doing all of them by themselves in spite of their hard work. This self-sustenance saves the labor and leads to the low price of products. Consumers can enjoy safety, good taste and low price of products. The system of Yu-ichi shows a prototype of new life supported by agriculture.

### ***Economical independence achieved by integration***

The most important characteristics of Yu-ichi is the integration of production, processing, distribution, and selling. Its members deal with all the processes related to the activities mentioned above. They produce foods, process and sell them by themselves. The fact that they don't need any goods or services from outside enable their economical independence. Their income has consecutively increased last sixteen years up to between five and nine million yen per year per family (about three million yen per year per person).

One other characteristic is its flexibility. Organized by a small group, it quickly responds to the needs of the consumers. In the process of growing up, it has also developed various businesses. Food supply to the school lunch, food delivery, tour operation for the urban people to visit farms where their foods are produced are some examples. The members of Yu-ichi are active to expand their market to outside their region to achieve economical independence.

### ***Multiple gifts***

Farmers have been called Hyakusho in Japanese. This name means one hundred titles. In other words, they do anything. The member of Yu-ichi are blessed with multiple gifts and deserve this name. Under the serious situation of Japanese agriculture, they had to be multi-talented to survive as farmers.

If we think globally, the modern system, that supported the development of conventional agriculture, is now at the edge of collapse, the integrated activity of Yu-ichi seems to show a model of new agriculture.

### **Next dream**

Yu-ichi means “dream market”. Its next dream is to start a full-scale business in harmony with the life actually well organized. To make this dream come true, they try to establish an economical system where people can cooperate rather than compete. Their methodology is simple but efficient: think, select and act. New attempt will bring up new problems. But the members of Yu-ichi believe that no problem is without solutions. They have already got through some difficult situations. As long as they hold the courage to continue their activities, the dreams will come true.

### **The history of Yu-ichi**

- 1979** Inauguration of Yu-ichi. 30 farmers' participation.
- 1982** Opening of Shinjo branch.
- 1986** Opening of Yamagata branch. Start of the food supply to school lunch.
- 1988** Improvement of food processing. Yu-ichi opened 81 times.
- 1990** Construction of new food processing plant.
- 1992** Contract of foods and accommodation supply for ten years with urban dwellers.
- 1993** Visit of 400 urban dwellers.
- 1994** Award of Best Agriculture in Yamagata Prefecture.

### **The case of Permaculture Center Japan**

Being supported by a local government, a university, a company and people sharing the same vision, Permaculture Center Japan (PCCJ) was established June 1 of 1996 with the objectives of constructing the structure of Japanese permaculture on the basis of its own natural and cultural conditions. It is located in a rural town about two hours from downtown Tokyo and endowed with natural environment.

The activities include:

- *Model construction* – It actually rent one acre of farm land and an old farm house. To construct a model site with them and collecting data on it is one of its main activities. The farm slightly slopes and faces south, with two streams running at the border. As this farm had been abandoned for more than five years, this model construction is all the more important from the view point of rural revitalization. Both local traditional farming technologies and modern ones are mixed in harmonious way to get better production. The house is now under renovation and will be equipped with an earth-friendly water and waste treatment system. In the next stage whole model sight will be designed. After the close observation of the site, its climatic and cultural characteristics will be identified and a landscape design responding to the requirements of nature and people living there is to be defined.
- *Theoretical construction of Japanese permaculture* – The research on Japanese rural villages to identify the crucial factors supporting their sustainability has been done together with the collection of information of sustainable settlement and of permaculture in other countries. The study of locally cyclical economy will be undertaken.
- *Promotion of permaculture and establishment of environmentally friendly business* – Permaculture certificate courses and workshops will be organized at

regular basis. Information sheets and some other publications will be issued. Some businesses such as permaculture consultancy and designing will be initiated to establish the financial basis of the Center and to give impact to the local economy.

### **Organization**

PCCJ is a membership-based organization. The members select the committee that supervise and is responsible for the activities. The secretariat actually manages daily works.

### **Problems**

As the Japanese rural society has very rigid structure and land is separated into small pieces owned by different owners, the activities of PCCJ get some restrictions. Realizing it almost impossible to construct a permaculture village in a vast area, its strategies is to get the people aware of the value of traditional social system and reconstruct sustainable society on the basis of the tradition.

### **Conclusion**

Being at one of those rare points in history – a time of great change, a time when change is unpredictable as it is inevitable, we need to realize what can serve as the basis of the next stage of the world. To rely on something beyond our control or separated from what we have constructed and verified in the history is least desirable. It should be emphasized that eternal development cannot be materialized by scientific or technological renovation.

We have no intention of urging the superiority of self-sustainable system of Japanese rural villages or generalizing their principles that are locally limited and have the meaning just in the context of Japanese culture. What we want to insist is that all the cultures developed and being developed by the living people's firm intention of creating better world and love for nature have sustainability and can contribute the further development of permaculture.

### **Appendix**

#### **Permaculture principles**

Valuations of spatial designs about Japanese traditional rural villages by permaculture principles:

- *Relative location*
  - [depth forest ~ village forest ~ windbreak ~ farmhouse lot ~ self-sufficient agriculture field ~ paddy field ~ river] a system of relative location with centre of farmhouse lot.
- *Each element performs many functions*

- **Functions of depth forest:** afforestation, keeping water, dwelling for many animals.
- **Functions of village forest:** afforestation, keeping water, producing mushrooms, dwelling for many birds, firewood, compost, building materials.
- **Functions of pond in farmhouse lot:** appreciation, thawing snow, producing fishes, making microclimate, fire prevention.
- **Windbreak:** screen from snow, firewood, compost, dwelling for many birds and insects, making microclimate, fixing soil.
  
- Each important function is supported by many elements
  - **Securing water:** valley water, well water, local water service, spring water, rain water.
  - **Fire prevention:** windbreak, pond in farmhouse lot, river.
  
- Efficient energy planning
  - Landuse planning with a centre of farmhouse lot group, [preservative ~ great productive area ~ dwelling area] securing sunshine, having good airing, controlling snow stock, locating farmhouse lot near edge of forest for securing water.
  
- Using biological resources
  - Bird function: bring many seeds up mountain against gravity.
  - Butterfly function: pollination.
  - Domestic animals' function: compost of faeces and urine using trees, eulalias and bamboos as building materials.
  
- Energy cycling
  - Compost of garbage, producing ashes for agriculture by burning refuse or soil, using water mill.
  
- Small-scale intensive systems
  - Small farmers land use system. [farmhouse lot ~ windbreak/channel ~ self-sufficient vegetable garden ~ vegetable field ~ copse]. A village was made by the connection of this system set.
  
- Accelerating succession and evolution
  - Cycle of slash-and-burn agriculture, maintenance of copse for producing woods and compost, keeping windbreak and village forest for sustainable production of forest-foods.
  
- Diversity
  - Producing soybeans in a footpath between rice fields, natural agriculture, collecting wild plants in the village forest, planting Chinese milk vetch before planting rice plants, various planting method.
  
- Edge effects

- Locating a village on the edge of forest for looking for water.
- Windbreak: connection area between natural ecosystem and human ecosystem.
- Edge of a river: various wet-ecological system, using grass for feeding domestic animals on a bank, using grass as farmhouse roof material.

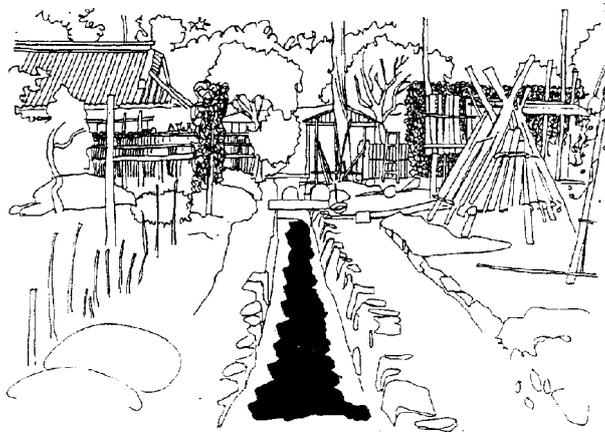
## Patterns



**Figure 4:** Farmer house landscape at foot of mountain



**Figure 5:** Windbrake and snowbrake forest



**Figure 6:** Farmer house lot with waterway for paddy field

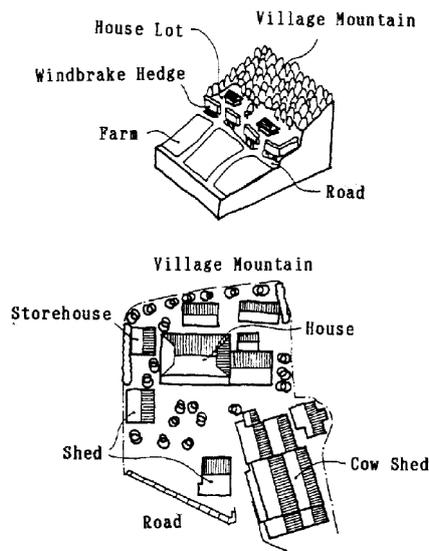


Figure 7: Farmer house landscape

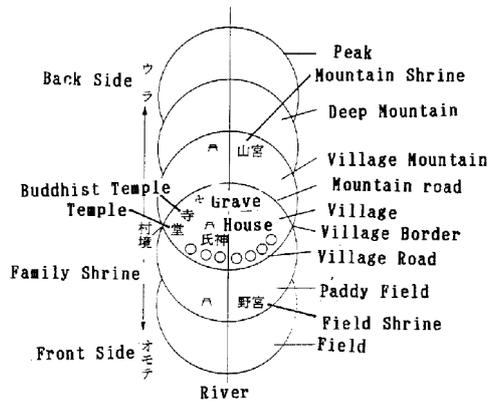


Figure 8: Primitive landscape in traditional village in Japan

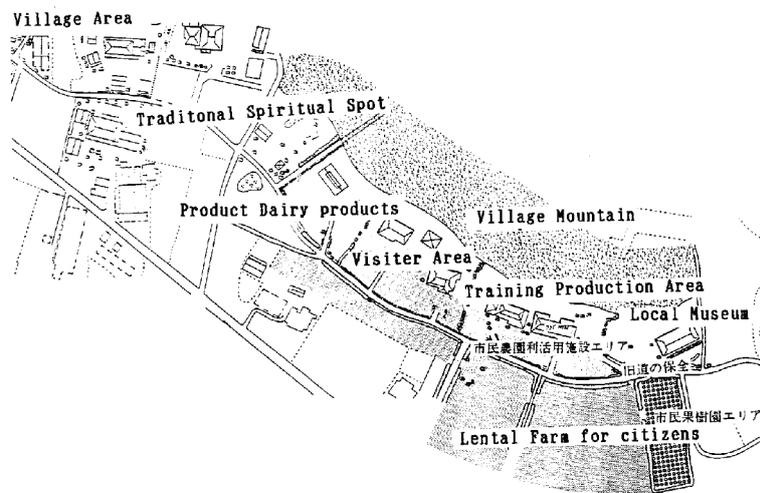


Figure 9: A reconstruction plan of a village of urbanize area in Tokyo