A Critical Study of Housing and Sustainability:

A Japanese Exemplar

Fumiaki SATO

PhD

The University of Edinburgh

2003

Declaration

This thesis has been composed entirely by the author. All work is attributable to and any errors are the responsibility of the author. None of the work contained in the thesis has been submitted for any other degree or qualification.

Signed: 20/6/2003

Fumiaki Sato

THE UNIVERSITY OF EDINBURGH

ABSTRACT OF THESIS

(Regulation 3.9.14)

Name of Candidate: **Fumiaki SATO**

Address :

Postal Code: **186-0003**

Degree: **PhD** *Date:* **20/6/2003**

Title of Thesis: **A Critical Study of Housing and Sustainability: A Japanese Exemplar**

No. of words in the main text of Thesis: **69,466**

This thesis investigates the relationship between housing and sustainability within a critical framework. It seeks to identify a possible new direction for Japanese house design, derived from an revised version of Patrick Geddes' theory and prioritising the reintroduction of a sense of continuity and gradual evolution. The argument starts from the presupposition that the issues surrounding architectural practice are intimately linked to global environmental concerns. Successful architecture depends on the interrelation of two factors, art (aesthetic criteria) and science (environmental awareness). In order to establish an approach towards sustainable development in housing the relationship between the two will be explored.

One approach towards developing a new sustainable architecture will be derived from the idea of reintroducing a greater degree of continuity. Contemporary society broke with traditional society when mythology (narrative knowledge) was replaced by reason (scientific knowledge) as society's organising principle. The distortion and unsustainability of the post-Enlightenment project led to the immobilisation of traditional narrative knowledge, particularly with regards to what it has to offer in relation to enhancing the quality of life, outside the domain of empirically-quantifiable material criteria.

Geddes' vision is based on the accumulation of individual syntheses, which help to generate the equilibrium between human and ecological activities at regional level, seen as the ultimate goal. This vision is set out in his diagram, "the Notation of Life", in which he proposed four stages of development — "Acts", "Facts", "Dreams" and "Deeds". Through the "Notation of Life" regional factors and the collective consciousness of citizens are brought together to work towards the establishment of new settlements. The investigation into sustainability in Japan will follow these four stages of the Notation of Life. It compares two administrative regions of Japan, Tokyo and Hokkaido, whose social and environmental conditions are both very different. It will look at their respective situations in relation to the policy of scrap and build and to the use of imported wood and will attempt to assess how any differences can be related to different regional characteristics and lifestyles.

In the conclusion, the two case studies will be brought together in order to develop a model for generating consensus between different groups of people in the house design process. The conflict between economics and ecology (both forms of scientific knowledge) will be resolved through the intervention of narrative knowledge. The alternative model for the design process will be characterised by the drawing together of art and science, representing a return to traditional notions of architecture. As a fusion of art and technology, the new architecture will have a part to play in building a new social consensus, crucial in order to re-establish a sense of continuity between personal experience and global environmental issues.

Table of Contents

INTRODUCTION

0.1 Art, science and technology in architectural design

0.1.1 Subjectivity and architecture

This thesis investigates the relationship between housing and sustainability. Its concern is not to draw up a blueprint for ecologically sustainable housing; rather, it aims to analyse the relationship between housing and sustainability within a critical framework. Most architectural design prioritises aesthetic concerns over issues of sustainability. This thesis sets out to identify ways in which a better equilibrium between the two might be developed. The argument starts from the presupposition that the issues surrounding architectural practice are intimately linked to global environmental concerns. Successful architecture depends on the interrelation of two factors, art (aesthetic criteria) and science (environmental awareness). In order to establish an approach towards sustainable development in housing the relationship between the two will be explored.

The primary function of architecture is to serve some of the oldest of human needs. Within the broad context of architecture, this thesis focuses on house design, as the form onto which individual desires are most often projected. The needs of individuals vary according to their particular condition; and the condition of an individual is largely a product of what is referred to as his or her "subjectivity". Subjectivity is not here taken as synonymous with "personality"; it is not that aspect of a person that manifests itself in his worldview or in the decisions he takes. Rather, it is the fundamental condition of selfhood, from which an idea of one's own specificity is derived. Subjectivity, understood in these terms, is thus closely linked to the way in which the self is created. Within each individual there are two forms of selfhood which mediate subjectivity. On the one hand there is the inner self, which expresses itself through desire and through the ego. On the other hand there is the outer self, which exists in relation to the external environment of the individual i.e. the community, society and background to which he belongs and with which he interacts. Subjectivity, therefore, exists as the equilibrium between these two notions of the self, the needs of the inner and outer selves acting to counterbalance each other.

Félix Guattari, a French psychologist, has proposed a definition of ecology into which the notion of the two selves can be incorporated. He subdivides ecology into three elements, as follows:

1. Subjective (spiritual) ecology,
2. Social ecology,
3. Environmental ecology.[1]

The conventional sense of the word "ecology" is equivalent to "environmental ecology" in Guattari's topology. However, his system also incorporates the notions of "subjective" and "social" ecology in order to generate a new holistic definition of ecology, based on a complete equilibrium between the three variants. By "subjective ecology" Guattari means the equilibrium between the inner and outer selves — the condition of subjectivity — as described above. In addition, subjective ecology is engaged in a dialogue with the other two forms of ecology. The outer self is structured by the power exerted by the "social ecology", in influencing lifestyles, fashions and cultural practices within a society. Pandering to the desires of the inner self, as it manifests itself through the desire for material consumption, is also detrimental to the environmental ecology, as recent global environmental trends make abundantly clear.

Architecture can be defined as a physical manifestation of the three ecologies. Throughout history, the changing nature of subjectivity has been reflected in the different relations between the three ecologies as they manifest themselves in architectural design. In traditional architecture, art and science were synthesised and symbolised through the use of myth; these myths then formed the basis of narrative knowledge in the collectivity. Personal identity was defined in relation to a shared mythology, which provided a structure for the evaluation of personal experience. It was also structured by the framework of institutions in place at any one time. Architecture therefore functioned to stabilise personal identity, by providing a concrete and permanent manifestation of an individual's worldview. In other words, architecture acted to stabilise subjective ecology, whilst also guaranteeing the sustainability of social and environmental ecologies.

Since the Enlightenment, science has acted to create a critical distance between the self and narrative knowledge, replacing its irrationality with scientific knowledge, which is equivalent to the Cartesian notion of Reason. The philosophical investigation into subjectivity began with Descartes'

"thinking subject" ("ego cogitans") and his mind-body dichotomy. Through his thought, Descartes unpacked religious and mystical definitions of subjectivity, the legitimacy of which had gone uncontested for generations. Modern science appeared to guarantee the autonomy of the individual, now liberated from the constraints imposed by various forms of irrational narrative knowledge. As Jürgen Habermas has said:

> "The project of modernity formulated in the eighteenth century by the philosophers of the Enlightenment consisted in their efforts to develop objective science, universal morality and law, and autonomous art according to their inner logic."[2]

Rationality, as it exists within society, can be split into three separate categories: the cognitive-instrumental, the moral-practical, and the aesthetic-expressive. Each of the three forms is validated through its association with the following characteristics respectively: truth, normative rightness, beauty. In theory, the application of scientific knowledge enabled the synthesis of all three, which in turn was intended to generate a new structure of knowledge. In practical terms however, industrialisation signalled the demise of traditional crafts, not just through an aesthetic re-evaluation but also through the decline of the milieux in which they were produced. Eighteenth century modernisers were keen to regroup all three forms of ecology under the heading of scientific knowledge, in order to generate the desired synthesis between art and science. They understood art to be the subjective expression of the aesthetic. Thus the incursion of science into society resulted in a reconstruction of the outer self. Indeed, both the outer and the inner selves were restructured in line with the predominance of science.

However, the notion that science was capable of explaining everything served only to highlight its limitations. For Habermas:

> "Positivism marks the end of the theory of knowledge."[3]

The culmination of the modernisers' project, envisaged as the assimilation of art into science, thus in fact, in the field of architecture constituted a renewed separation of the two poles. The predominance of scientific knowledge and rationality in design that ensued helps to explain the

narrow aspirations of contemporary architecture. As the arts and sciences once again diverged, so it became impossible to group everything together under the banner of reason.

> "... the arts and sciences would promote not only the control of natural forces but also the understanding of the world and of the self, moral progress, the justice of institutions and even the happiness of human being. The twentieth century has shattered this optimism. The differentiation of science, morality and art has come to mean the autonomy of the segments treated by the specialist and their separation from the hermeneutics of everyday communication."[4]

The pursuit of universal subjectivity, which formed the core of the modernisers' project, was superseded by the emerging power of capitalism. The effect of capitalism on the two conditions of subjectivity was to create an outer self that overvalued wealth, seen as an indicator of economic growth, and to cultivate an inner self ruled by egotism, with the result that in capitalist societies, individual liberty goes paradoxically hand in hand with economic oppression. Society is no longer structured by the stipulations of scientific knowledge and is instead in the thrall of new technologies that have a direct impact on stimulating economic growth. One consequence of this is that within highly developed capitalist economies the income gap has narrowed and more and more individuals enjoy the opportunities to fulfil their desires — insofar as these can be satisfied by material consumption. On a day to day basis it is still only people's physical needs are catered for, since the satisfaction of these is seen as the sole measure of social progress. Even psychological needs are subordinated to this logic, for people are only able to meet those that can be satisfied through the consumption of a particular product, itself designed to play on this need. As a consequence, psychological needs are undervalued in society; the failure to recognise their importance makes it difficult for individuals to develop fully their own identities, which previously had been validated either by "mythology" (narrative knowledge) in traditional society and then since the modern age by the pervasive power of reason (scientific knowledge). The psychologist Peter Russell argues that nowadays each of us is left trying to derive a sense of self from the assimilation of the following elements:

> "my personality, my character, my job, my social status, my sex, my body, my nationality, my name, my family, my ideals, my beliefs, my education, my interests, my clothes and even,

sometimes, my car. None of these are really who 'I' am: they are things we have or do, things that describe us and identify us to others. They are how the 'I' is seen rather than the essence of 'I'."[5]

The "I", as expressed in these terms, is thus destined to perpetuate the process of material consumption in order to sustain its sense of identity. In this quest for one's own identity, the outer self, heavily influenced by the media, has been pushing the inner self towards increased material consumption.

House design, which also has artistic and scientific aspects, is constantly subject to new technological fads. With regards to house design, art operates as the fulfilment of the desire to create an individual aesthetic which to satisfy personal desires, and technology, or science, is that which is deployed in order to attain ever higher standards of living. Yet both aspects of design are driven by the same relentless logic: economic growth.[6] Within society, one's house is perceived as the fulfilment of every desire. It is through our houses, as status symbols, that we project out identity onto society. Thus new building is believed to be driven by a desire on the part of consumers to improve and personalise their living environments. This belief is a myth: the desire is no more than an advertiser's creation, designed to increase consumer spending.

0.1.2 The crisis in architecture and a definition of sustainability

If the aim of post-Enlightenment architecture has been to synthesise the three categories of reason (the cognitive-instrumental, the moral-practical and the aesthetic-expressive) then contemporary architecture can be said to be in a state of crisis, since it has distorted these categories and failed to create the requisite synthesis. The crisis in architecture is therefore taken to mean its current failure to serve adequately either people's physical or psychological needs. The reasons for which architecture has found itself in this situation can be analysed from two angles: its function as a creative form (design) and its function as a social necessity (use). The first function corresponds to architects' needs to create an aesthetic object and the latter corresponds to the purpose that the finished product, the buildings, fulfils for the people who use it. To appeal to the superficiality of the consumer society, architects have been designing disposable but fashionable buildings with a short lifespans, perpetuating a cycle of scrap and build. The consequence of such architectural practice is that

buildings no longer intrinsically satisfy the needs of the users.

From an ecological perspective, current architectural practice is pushing the environment to its limits. Architectural designs fall out of fashion and are replaced long before they reach the end of their physical lifespan, leading to excessive resource and energy consumption and consequently to increased CO_2 emissions. This increase in CO_2 emissions is evidence of the extent to which architecture is currently failing to achieve a stable equilibrium between the subjective, the social and the environmental ecologies. Architecture is driven by economic concerns, economics being the principal motor of our society. This contrasts with the concerns and function of ecology, which are to protect nature and to sustain life in biological terms. Architecture and ecology are thus at inherently at odds with one another, since their purposes are so dissimilar. This bipolarity calls into question the desire of architects to continue to provide for human needs only on a superficial and materialistic level, without investigating the ethical and environmental foundations of their practice.

If architecture is to become more sustainable then the current practice, which actively encourages a policy of scrap and build, must be challenged. New ways of bringing together science and art must be developed to replace the modernist project of forging a synthesis through the application of scientific knowledge. The aesthetics of architecture should be relocated in an emphasis on spiritual richness and architects must also endeavour to establish harmony with the natural world. Instead of constantly striving to increase living standards, technology must redefine its role and move towards improving the quality of life through enhancing its sustainability.

There is one premise from the basis of which architecture could become genuinely sustainable. Sustainability in architecture should be perceived neither as a way of harnessing technology to solve global environmental issues nor of encouraging greater economic sustainability. The hypothesis is as follows: architecture must become a practice which brings together a variety of forms of sustainability — including ecological and economic sustainabilities — in order to achieve an overall improvement in the quality of life. It is therefore appropriate to ground any attempt to outline what architectural sustainability might imply in anthropology, since architecture is both a product of and a requirement of the community. Starting out therefore from an anthropological standpoint, the main focus of this thesis will be an attempt to discover how all the various forms of sustainability might be brought together, in order to fundamentally reform architectural practice.

One approach towards developing a new sustainable architecture will be derived from the idea of reintroducing a greater degree of continuity. As we have seen, contemporary society broke with traditional society when mythology (narrative knowledge) was replaced by scientific knowledge as society's organising principle. The distortion and unsustainability of the post-Enlightenment project led to the immobilisation of traditional narrative knowledge, particularly with regards to what it has to offer in relation to enhancing the quality of life, outside the domain of empirically-quantifiable material criteria. The consequence of this rupture has been the emergence of two parallels types of architectural practice: on the one hand a technical practice, serving only physical and practical needs and expressed in complex terminology and on the other hand an alternative practice grounded in the satisfaction of psychological needs. This more psychological form is characterised by the concrete expression of autonomous selfhood. However, it struggles to put its case across because of the prevalence of technology-driven architectural practice. A new sustainable architecture will seek to integrate the two forms.

Architectural sustainability could also be derived from the resolution of the tension between the two bodies of knowledge i.e. the scientific body (reason) and the narrative body (tradition, mythology). Sustainability is usually considered only as the harmonisation of ecological, socio-political and economic demands, without taking spirituality into account. This thesis introduces the notion of "spiritual sustainability" in order to satisfy society's psychological needs. In so doing it hopes to provide a space within which individuals will feel free to explore their social needs and within which they will feel empowered. Subjectivity, as we have seen, consists of a balance between the needs of the inner and outer selves. Sustainability in architecture will aim to mirror this balance, not only by counterbalancing economic and ecological sustainabilities in order to ensure socio-political stability, but also by ensuring that all of the above concerns are weighed against the autonomy of the self, the essential condition of spiritual sustainability.

0.1.3 Patrick Geddes: A critical process

In order to move away from current architectural practice and its consistent undervaluing of narrative knowledge, it is necessary to challenge the way society jettisoned continuity in the shift from modernity to post-modernity. The triumph of reason over the modern consciousness resulted in the emergence of two different architectural visions by two very different practitioners. The first is Le

Corbusier, who revolutionised the architectural mainstream at the beginning of the twentieth century and the second is the city planner, Patrick Geddes. His vision is of a holistic community, inspired by and incorporating traditional society. Thus Geddesian thought, which seeks the synthesis of art and science in planning, can be defined as the "other modern" approach, as set against Le Corbusier's mainstream vision.[7] Le Corbusier's work is characterised by its rupture with tradition and with its failure to adapt his rigid scientific vision to regional variations. Le Corbusier believed that beauty was an absolute that could be achieved through a synthesis of art and technology as expressed in architecture; the consequence of this attitude towards aesthetics was that he believed his designs to be universally applicable and valid. Geddes on the other hand refused to devalue more traditional narrative knowledge, arguing that it should be used to interpellate scientific theories, testing their historical validity. In so doing he initiated a re-evaluation of the region from the perspectives of both mythology and modern science. The region in his vision is primarily a geographical entity, but one which embodies continuity from traditional society right through to its contemporary successor. Traditionally, the region, the boundaries of which may be geographically designated by watersheds, provides the fundamental basis for any one community, in which local architecture exists in harmony with the regional ecology. This vision of the region can be applied worldwide. Geddes' vision is based on the accumulation of individual syntheses, which help to generate the equilibrium between human and ecological activities at regional level, seen as the ultimate goal. This vision is set out in his diagram, "the Notation of Life", in which he proposed four stages of development — "Acts", "Facts", "Dreams" and "Deeds". Through the "Notation of Life" regional factors and the collective consciousness of citizens are brought together to work towards the establishment of new settlements. Geddes' approach, which emphasises continuity and gradual social evolution stands in sharp contrast to Le Corbusier's thought, which provides the justification for much current technocratic architectural practice, and which is characterised by discontinuity and revolutionary upheaval. This thesis employs the Geddesian paradigm of consensus-creation as the basis for the search for a new sustainability in architecture.

However, this ambition is also problematic. It is difficult to imagine how a consensus based on the Geddesian approach could emerge in contemporary society. The current state of architectural practice reveals very clearly the extent to which continuity and an evolutionary approach as envisaged by

Geddes are not givens in the same way that, from the positivist perspective, reason, (scientific knowledge) as a basic principle, is. Closer integration between the two bodies of knowledge has to be actively sought; their synthesis will not occur organically. Achieving this integration implies an emancipation of the self from the constraints imposed by all-pervasive scientific knowledge and its crippling effect on the development of knowledge as a whole. Critical Regionalism, a practice inspired by the techniques of Critical Theory is crucial to this process of development. Critical Regionalism is understood as a renewed focus on self-examination, self-questioning and self-evaluation, which together enable the creation of personal narratives at regional level. The development of these personal narratives will enable the creation of a new consensual definition of sustainability in architecture, since they will provide a vehicle for the expression of the inner self in architectural design, both in the act of design and in the fact of building use. In this way both the design of buildings and the ways in which people use them will represent a projections of the self, and these multiple projections will all serve to illustrate the diversity of personal narratives coexisting within the same project. The coexistence of these multiple narratives demonstrates the way a consensus will take the form of an extension of the Notation of Life: an interweaving of narrative knowledge rather than a positivist attempt to make everything confer with the dictates of scientific knowledge. The enhanced status afforded to narrative knowledge will allow it to present a challenge to the predominance of scientific knowledge, rather than simply being assimilated by it, as is currently the case. Thus an alternative relationship between the bodies of narrative and scientific knowledge will emerge through the design process.

The understanding of subjectivity as derived from its revision in the context of the Notation of Life constitutes an equilibrium between the inner and outer selves at regional level that evolves over time. As human needs change, so the regional consensus will evolve. This process of evolution will be central to the new sustainability in architectural design.

0.2 Japan: A case study

The theoretical investigation presented in this thesis into sustainability in house design will be supported by an assessment of its applications in the design of detached houses in Japan. Traditionally built from locally available wood, since the war new technology has been incorporated into construction of these houses. This marriage of traditional design and new technology will be revealed as exemplifying the idea of sustainability in house design at regional level.

This thesis will seek to identify a possible new direction for Japanese house design, derived from an revised version of Geddes' theory and prioritising the reintroduction of a sense of continuity and gradual evolution. This new direction will seek to fit the traditional fusion of art and science into the contemporary critical framework. The investigation into sustainability presented in this thesis will follow the four stages of the Geddesian Notation of Life. The first stage, "Acts" will consist of an examination of the overall state of Japanese housing and the extent to which it can, or cannot be considered sustainable. Given its high level of industrialisation, Japan as a country has attempted to make use of technology in order to achieve a balance between the demands of the economy and the needs of the environment. However, as we have seen, the introduction of new technology functions primarily to increase economic growth and to raise material standards of living. The emphasis on technological improvement has encouraged the pursuit of a policy of scrap and build in the Japanese housing market; this approach is enabled only by the excessive consumption of imported wood. The short life expectancy of the average Japanese house is thus a major contributory factor to the overall increase in CO_2 emissions. The growth in the number of detached houses being built in Japan is evidence of people's desire to improve their material standards of living; the rate of growth has however outstripped the capacity of the domestic timber industry and this has increased Japan's dependency on wood imported from overseas. The postmodern trend for housing as a disposable fashion object has resulted in damage to the environment. The technocentric attitude towards life so prevalent in Japan means that ecological sustainability is continually subordinated to economic demands. The fact that the housing industry not only satisfies only its users' material needs but is also failing to contribute to the effort to reduce CO_2 emissions is clear evidence of the extent to which architecture in Japan can be said to be in a state of crisis.

The idea that individual desires can be fulfilled through material consumption is a relatively new concept in Japan; emerging only after 1945, it illustrates the extent to which the war acted as a watershed in Japanese social history. Modern science and technology have had a profound impact on the healthy balance between art and science that existed in Japanese architecture prior to this period. The crisis in Japanese architecture, in parallel with the failure of the modernist project as exemplified by Le Corbusier, can be explained by this radical shift away from traditional values and towards a consumer society.

In the next stage of the Notation of Life — "Facts" — this thesis will demonstrate how the same radical shift can be identified in individual attitudes towards environmental issues on a more mundane level. The aesthetics of Japanese architecture have drifted away from traditional norms and have instead come to be defined by personal desires as aroused by the media; this shift reveals the paradoxical condition of subjectivity within the consumer society: one believes oneself to be acting freely when in fact one's actions are entirely determined by external factors such as marketing. The current policy of scrap and build and the excessively high levels of timber imports are both consequences of this emphasis on housing as a disposable product like any other. An alternative approach to architecture would focus not on the fulfilment of material needs but on the unique psychological needs of a self liberated from the pressures of consumerism. Hence the importance of paying attention to the diversity of human needs and the variation of resources from region to region. This thesis compares two administrative regions of Japan, Tokyo and Hokkaido, whose social and environmental conditions are both very different. It will look at their respective situations in relation to the policy of scrap and build and to the use of imported wood and will attempt to assess how any differences can be related to different regional characteristics and lifestyles. In Tokyo, architecture is primarily characterised by scrap and build; this corresponds to the wishes of a high-density urban population. In Hokkaido however, the biggest problem is the excessive use of imported wood, despite the abundance of local resources; this reflects the predominance of a certain economic approach. These two very different issues, which both have their roots in the general state of architecture in Japan, are explored separately in order to emphasise the importance of regional factors in solving such problems.

The two situations described above will be investigated side by side. In the third stage of the

Notation of Life — "Dreams" — this thesis will investigate the practical implications for decision-making of the attitudes identified in the "Facts" stage. This study will reveal the way in which the process of decision-making is dominated by advertising and the media. In Tokyo, notions of environmental degradation are actually being employed to hasten the destruction of traditional houses so that they can be replaced by buildings that are better insulated and more energy efficient. Thus links between houses and their surrounding environment are being severed. In Hokkaido, natural resources are being looked at less as a material asset and more in terms of the contribution that they have to make towards the development of the leisure industry. However, the economic motivation behind this shift has led to the promotion of a very one-sided view of the environment, which may not take into account all the requirements of the local ecology. The negative implications of both these examples of the "Dreams" stage demonstrate the extent to which the consumer society has stripped individuals of their capacity for making independent decisions that really meet their needs. The consequence of this is a negative outcome in the "Deeds" stage: the policy of scrap and build in Tokyo and an excessive reliance on imported wood in Hokkaido.

The realisation that the outcome of the design process is negative will hopefully result in the elaboration of an alternative version of the "Dreams" stage, taking into account the different requirements of each region. The process of re-evaluation must incorporate the liberation of subjectivity from the overriding control of the outer self, and take into account the human needs experienced in the inner self. In the case of Tokyo, a re-evaluation of what constitutes quality of life will lead to a reassessment of the potential of houses based on traditional designs. In the case of Hokkaido, reassessing the potential value of and uses for regional resources will lead to a vision of the way in which local industry might be redeveloped.

Through the parallel case studies of Tokyo and Hokkaido this thesis sets out to test the applicability of the Notation of Life to Japanese architecture, both as a structural framework to illustrate the nature of its current failings and also as a means by which an alternative architectural practice might be developed. It will seek to develop a definition of architectural sustainability incorporating both art and science as well as spiritual and practical considerations. Thus a new value-system that takes into account a broad understanding of what constitutes quality of life will be inaugurated.

In the conclusion, the two case studies will be brought together in order to develop a model for generating consensus between different groups of people in the house design process. The conflict between economics and ecology (both forms of scientific knowledge) will be resolved through the intervention of narrative knowledge. The alternative model for the design process will be characterised by the drawing together of art and science, representing a return to traditional notions of architecture. As a fusion of art and technology, the new architecture will have a part to play in building a new social consensus, crucial in order to re-establish a sense of continuity between personal experience and global environmental issues. Although this study restricts itself to the creation of consensus around architectural projects, it will not be difficult to see how the process indicated could be extended to the whole region through the identification of how history, culture and the economy all interrelate at regional level. Thus the primary aim of this thesis is to establish a comprehensive vision of architectural sustainability, which takes into account the ecological, economic, social and spiritual characteristics of each individual region.

---

1 Fèlix Guattari, Les Trois Ecologies, trans. Masa'aki Sugimura (Tokyo: Ohmura Shoten, 1993), pp. 12-3.

2 Jürgen Habermas, "Modernity — An Incomplete Project", in New German Critique, 22 (Winter, 1981), p. 8.

3 Jürgen Habermas, Knowledge and Human Interests, trans. by Jeremy Shapiro (London: Heinemann, 1972), p. 67.

4 Jürgen Habermas, "Modernity — An Incomplete Project", in New German Critique, 22, pp. 8-9.

5 Peter Russell, "The Psychological Roots of the Environmental Crisis", in Robert Krieps (ed.), Environment and Health: a Holistic Approach, (Hants, Gower, 1989), pp. 222-3.

6 See: Jürgen Habermas, Toward a Rational Society: Students Protest, Science, and Politics (Cambridge: Polity Press, 1969).

7 See: Colin St John Wilson, The Other Tradition of Modern Architecture: The Uncompleted Project (London: Academy Editions, 1995).

CHAPTER 1:

Sustainability and Housing: Defining the Problem

The contemporary issue of climate change is related closely to a wide range of human activities. From a scientific point of view, climate change is caused by the emissions of so-called "greenhouse gases" into the atmosphere. Since the Industrial Revolution, technological developments have been increasing the anthropogenic emissions of greenhouse gases, mainly carbon dioxide (CO_2). The developed countries have been primarily responsible for these emissions and the resultant climate change. Currently, the large amount of CO_2 emitted by the developed countries is the main reduction target.

Architecture is no exception, for it is one of the major human activities influencing our planet's ecology and its sustainability by consuming large amounts of energy and resources. Although there is little doubt that architectural construction has a major impact on climate change, construction itself continues in order to sustain various human activities. In spite of an increasing general comprehension of global environmental issues, there is not always a direct motivation for changing individual awareness and activities in a way that reduces CO_2 emission. Sustainability, therefore, must be defined according to an equilibrium among different activities, each of which has a relationship to ecological sustainability. Similarly, the sustainability of architectural design cannot be achieved directly by reducing CO_2 emissions technologically; instead, we should seek answers in the fundamental purposes of architecture, i.e., existence and design. The former might be called existence in architecture, and the latter is design in architecture. These are also recognised as significant factors for architectural sustainability.

1.1 Defining the problem

1.1.1 Housing: Manifestation of two human needs

It could be said that individual human needs and housing are identical in meaning. Human needs are abstract concepts derived from the self, and housing corresponds to them physically. As architecture consists of the two aspects of existence and design, human needs can be analysed

according to these two parallel definitions of architecture.

First is existence in architecture. Existence means not only physical existence as a result of construction, but also implies the reasons for building under particular subjective, social, and ecological conditions. The satisfaction of human needs is the primary reason that housing is built. Architecture helps assure physical health by supplying shelter to protect people from the elements and social factors. It is also the medium between the self and the outer world, a means by which individuals identify themselves in the world both consciously and unconsciously. In this sense, the pursuit of identification as a psychological need is satisfied by architecture.

These two roles of architecture as a response to physical and psychological human needs correspond to the thesis of the economists Len Doyal and Ian Gough, who point to "physical and mental health" and "autonomy" as the basic human needs. "Physical and mental health", or "survival" as it is also called, is "linked to the avoidance of serious harm". It has the negative meaning of avoiding disease and illness in order to optimise life expectancy. Their view is the technical understanding of health as universal and transcultural, to be applied to everyone and every place. On the other hand, "autonomy", or "identity" as it is otherwise known, appears locally, interacting with specific sociocultural factors.[1] People look for different ways of satisfying "autonomy" and "identity" depending on what information is provided to each individual by society. The outer self, who is one of the two divisions of subjectivity, is created through interaction with society.[2] However, as the psychologist Peter Russell shows, in the current context of identity crisis, the individual's need for autonomy is not always satisfied by social systems because the satisfiers are distorted by the dominating economic value.[3] Autonomy is no longer expected in individuals as equilibrium between the inner and outer selves. This crisis of subjectivity can influence existence in architecture as its physical manifestation. The outer self is persuaded to choose new housing because it is dominated by the images of housing and lifestyle that are created through the media. In other words, housing exists in order for individuals to acquire artificially created images so that they can locate themselves in a particular position in current society.

On the other hand, design in architecture means the practical processes of design and construction. It is strongly associated with socio-economic activities. Doyal and Gough also define the higher needs as basic societal needs consisting of "material production", "reproduction", "social communication"

and "political authority".[4] In this definition, design in architecture could be explained by the societal need of "material production". Its primary concern is to sustain economic activities, thus dominating the motivation for the current architectural design. In order to sustain housing design as an economic activity, it must satisfy the users' needs, which is a requirement of "social communication". Yet, in the current dominating economic sense of value mentioned above, communication between architects and the users would be absorbed as one of the crucial issues in architecture.

Through this definition of architecture as a collective human imperative, existence in housing is associated with users' needs, which are concerned with choosing their housing and living in it. Design in housing is related to the needs of architects and builders. The following argument reveals the historical context of existence in architecture, and by that means inquires into the changing meanings of design in architecture through the modern and towards the postmodern age.

1.1.2 Existence in architecture

"All the arts had their origin in efforts to satisfy the needs of the body and the mind."

William Richard Lethaby[5]

The definition of housing based on human needs is rooted in the architectural theory of antiquity. Vitruvius defines architecture in the third chapter of Book I in Ten Books on Architecture as:

firmitas (strength),
utilitas (utility),
venustas (beauty),

in which both the practical and the aesthetic senses of architecture are identified. The three elements are interrelated, creating the aesthetics of architecture as a whole, which are implied in the meanings of "venustas".[6] More practically and physically, in the nineteenth century the German architectural theorist Gottfried Semper defined architecture by the four elements of:

the hearth,
the roof,
the enclosure,

the mound.[7]

The practical meaning of the hearth is "the first sign of human settlement and rest" for "the reviving, warming and food-preparing flame." It formed the centre of the sacred place. This corresponds to securing the basic physical needs, which are extended towards the psychological needs. The hearth mediates between the self and the outer world by its mystical meaning. The other elements were developed in order to protect this practical and sacred hearth, as the symbol of the satisfied physical and psychological needs.

The early modernist William Richard Lethaby most clearly proposes the origin of architecture in relationship to human needs.

> "In the main we find two great factors, response to need — the basis in utility — and, secondly, a magical and mystical element."[8]

This argument, together with that in his quotation at the beginning of this section, clearly show the relationship between architecture and human needs. "Utility" corresponds to the needs of the "body", and the "magical and mystical element" to those of the "mind". Architecture is thus derived from both physical and psychological human needs, and is the manifestation of the appropriate form for these needs. Each of these interpretations of architecture points out the meaning of practical art that serves an end other than itself as the fusion of art and science, or mysticism in its primitive sense.[9] Housing, defined as a part of architecture, also has the same characteristic, but on a more personal level. Since housing is one of the major sites for the individual's life, the meaning of human needs is more acute in housing than in other types of buildings.

In a sociological sense, the fusion of art and science can be examined from the communication among different attitudes to architecture. As shown in Figure 1, the German sociologist Jürgen Habermas presents a provisional framework for the relationship between the three worlds and attitudes.[10] The diagram, called "rationalisation complexities", consists of two axes: worlds (objective, social, and subjective) and basic attitudes (expressive, objectivating, and norm-conformative). The rationality within the heavier lines in each of the three basic attitudes is defined as generating human knowledge in society. Habermas names these three rationalities as "cognitive-instrumental rationality",

"moral-practical rationality", and "aesthetic-practical rationality".[11] In defining housing as art, as one of its two elements it would be located in "art" as the intersection of the expressive attitude and the objective world in the diagram. "Art" also develops aesthetic practical rationality with "eroticism" by its expressive attitude in the subjective world. "Venustas", as one of the principles of architecture by Vitruvius, implies "eroticism" as beauty.[12] This confirms the process from the needs of the mind, which are sought as "eroticism", towards creating architecture in "art" as the symbol of their satisfaction.

At the same time, "art" in the diagram is juxtaposed with "science, technology", which develops "cognitive-instrumental rationality" together with "social technologies" in the objectivating attitude. This seems to restrict aesthetic freedom practically and physically. However, since architecture is defined by its strength (firmitas) in a Vitruvian sense, the natural laws and the physical structure will amplify the architectural aesthetics. Among Vitruvius' three principles, art and science do not conflict with or compromise each other, but assimilate each other, interchanging their meanings. In this way, existence in housing reveals itself as the manifestation of the physical, and the psychological needs as art and science in a synthesised form.

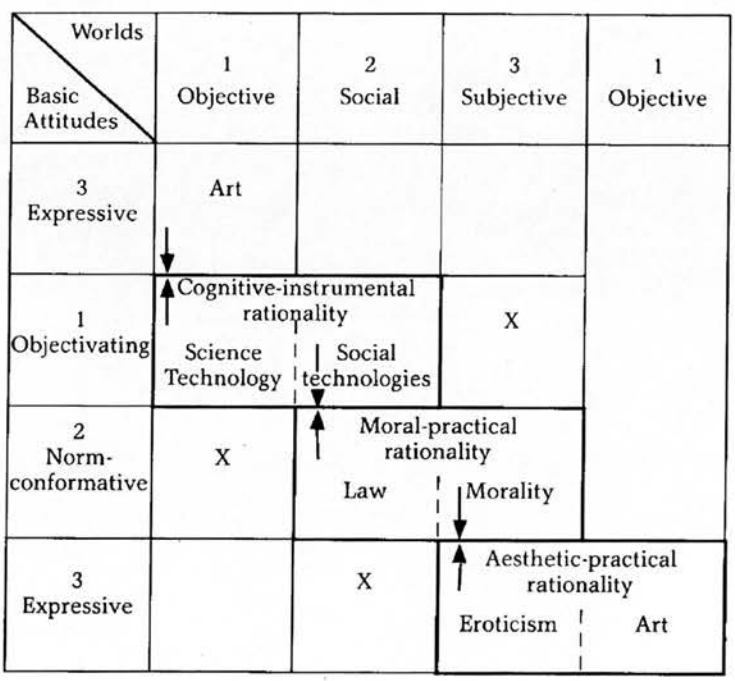


Figure 1: Rationalisation complexities

Source: Jürgen Habermas, The Theory of Communicative Action, Volume 1: Reason and the Rationalisation of Society, trans. Thomas McCarthy (Cambridge: Polity Press, 1987) p. 238.

1.1.3 Design in architecture

When a design is identified from a socio-economic point of view, it has to be comprehended in a particular sphere that includes practical activities such as the supply of labour and materials. Historically, a geographical region can be defined as a unit for material supply, construction technique, and the generation of vernacular architecture. In other words, architectural design epitomises the social systems of the region in which architecture is built.[13] Architectural design manifests itself uniquely according to each period. The transition from traditional architecture to modern and towards postmodern architecture symbolises a process of change in social systems. In his book Community Design and the Culture of Cities, Eduardo E. Lozano, an urban planner investigates the two parallel traditions of popular design and professional design. The tradition of popular design is rooted in local culture, which is based on the members of the local community. It is developed through an accumulation of their empirical knowledge from generation to generation. Community design, as a practical method for designing and building in the popular design tradition, is defined as follows:

> "Community design was once within the exclusive domain of craftsmen and artisans, townsfolk, villagers, and peasants, who were the designers, builders, and users of their own settlements. There was relatively little specialization, and as a result, no clearly identifiable group was responsible for community design: the activity was fairly open to many members of the culture. Design training was acquired through imitation at first and supported by memorization of practical rules (sometimes reinforced by magic or ritual), which defined the "correct" way of doing things: the continuity of traditional solutions was both cause and effect of this type of training. The development of valid and accepted traditions, handed down from generation to generation with only minor changes, was made possible by the high degree of stability typical of these cultures."[14]

On the other hand, the professional design tradition is defined as follows:

> "It [professional design] is part of the so-called high culture, in which design work is produced for a client or patron of the arts, a member of the elite of a relatively complex society. Design activity is a result of the individual initiatives of the professional architects, who receives critical feedback from clients, fellow practitioners, and the elite at large. Styles, fashions, fads, academies, school, and boards are all components of this tradition."[15]

The popular tradition has been building human habitats, and the professional tradition has been designing public and institutional buildings. Urban dwellings had been designed mainly in the traditionally communal method until the Industrial Revolution.[16]

From a sociological point of view, Habermas shows a contrast between traditional society and capitalism. In traditional society, vernacular architecture supports traditional social systems both physically and metaphysically.[17] Physically, it is based on regionally available materials, methods, and their adaptation to such natural factors as climate and geography. Metaphysically, the architectural forms and available techniques sustained the institutional frameworks. Traditional society, as Habermas claims, is dominated by a centralised ruling power symbolised in myth.[18] As identified by the mystical element in it, architecture was an epitome of the worldview which society shared in ordinary language, legitimising political power in a metaphysical structure. Creating architecture not only sustained the cosmologically based identification of the individual in order to satisfy psychological needs, but also sustained traditional society by stabilising the socio-political structure in order to satisfy societal needs. Habermas points out that the institutional framework rules "the stable pattern of a pre-capitalist mode of production, pre-industrial technology, and pre-modern science", which parallels the tradition of popular design at a traditional, communal level. In order to sustain this framework, the traditional architectural forms and techniques were prevented from evolving or changing dramatically.

Explored through Habermas' "rationalisation complexities" in Figure 1, vernacular architecture in traditional society is summarised in Figure 2. Architecture, as the fusion of art and science, functions as a connection between individuals and society. Individuals seek "eroticism" as a way of sustaining one's own identity, which is represented in "art". Construction of "art" also requires "science, technology", which consists of appropriate material use and construction techniques meant to sustain their construction activities. These are supported by the traditional socio-political structure of "social technologies", which secure this process of creating architecture in order to sustain the societal needs of "political authority".

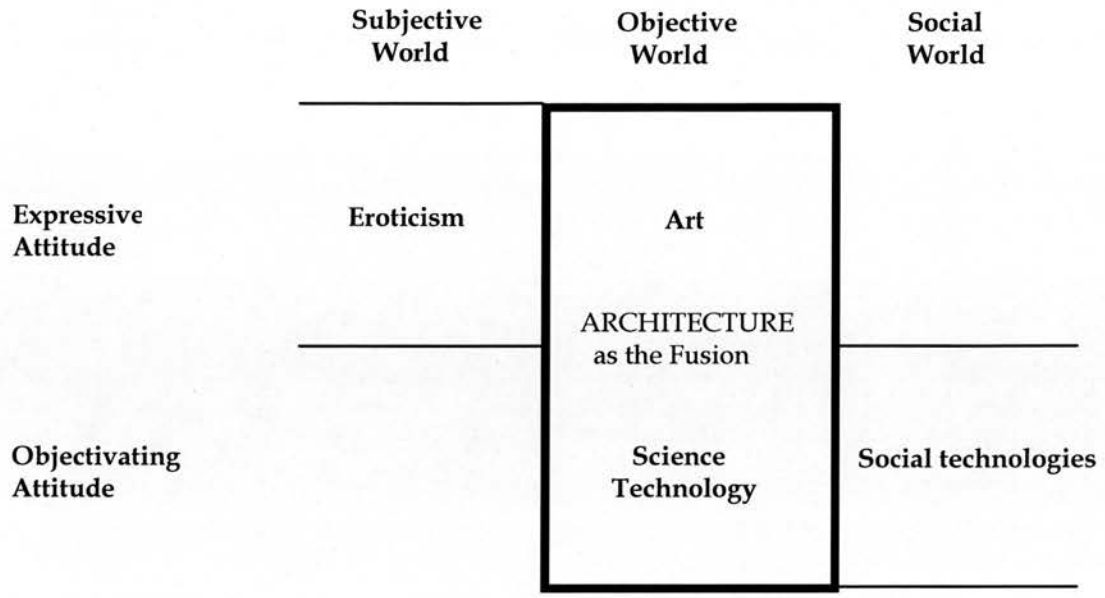


Figure 2: Vernacular Architecture in Traditional Society

Source: Jürgen Habermas, The Theory of Communicative Action, Volume 1: Reason and the Rationalisation of Society, trans. Thomas McCarthy (Cambridge: Polity Press, 1987), p. 238.

Since the Industrial Revolution, housing construction has been shifting towards relying on professional design. According to Habermas, capitalism is summarised as follows:

> "The superiority of the capitalist mode of production to its predecessors has these two roots: the establishment of an economic mechanism that renders permanent the expansion of subsystems of purposive-rational action, and the creation of an economic legitimation by means of which political systems can be adapted to the new requisites of rationality brought about by these developing subsystems."[19]

After the expansion of the capitalist economy and its legitimatisation, the institutional framework of traditional society lost its power legitimise myth. The coherent structure of individuals, society, political power, and the mystical meaning of nature subsequently collapsed. Narrative knowledge based on ordinary language and intersubjective comprehension of the world has been replaced with scientific knowledge, which is ruled in terms of technical language.

Since the sixteenth century, the Enlightenment had been emancipating the self and the individual's relationship with architecture from the domination of the mystical worldview, which it accomplished by accumulating modern scientific knowledge and increasing its power in society. In Habermas'

"rationalisation complexities" shown in Figure 1, based on this dominating power of scientific knowledge, the Enlightenment sought the alternative synthesis of the three rationalities. Emancipated architectural design also seeks the alternative synthesis with modern science and technology. In the eighteenth century, modern architecture had been led from practical art to serve an end towards pure art to serve itself — art for art's sake. In late modern architecture since the 1920s, architecture as art for art's sake has reached its summit, as represented by Le Corbusier's definitive work of modern architecture. The shift from architecture as the fusion of art and science has led to a division between architecture as beauty, and building as mere utility, which corresponds to the art-science distinction.[20] The concept of the region had been absorbed into the design rhetoric of universalism.

The limitations of the modernist project, however, revealed themselves in the definition of subjectivity. The emancipated pursuit of ego had gone beyond the equilibrium premised by the modernists. Represented by "pop-art" and "mass-culture" in the 1960s, architecture contributed to the "hedonism of capitalist consumerism", in which individuals pursued "what they want" under pressure from the media.[21] This condition of subjectivity created by information delivered through the media has attained "ego-realisation".[22] Capitalist society has lost the common worldview which traditional society had in terms of myth and religions, and which modern society also sought in terms of natural scientific knowledge.[23]

Vernacular architecture in capitalism no longer has the same meaning as in traditional society. Architectural design is based on international markets, and the region is only defined linguistically through the media. Charles Jencks calls "Neo-vernacular" architecture a trend of postmodern architecture, which has been developed as a return to a kind of vernacular through the failure of modern architecture since the 1960s. Neo-vernacular, in which traditional materials and forms are brought back, is intended to revive "humanism" in architecture rather than reconstructing the social systems that supported its construction practically in traditional society. Traditional architectural elements create popular images of the "good life", which supposedly existed in the past and which had been destroyed by modern architecture. Its elements are symbolically brought into current architecture to develop a possible consensus on housing form, and grounding collective individual desires in a common historical context. Yet, this quasi-vernacular only serves as a comfortable image for the middle class, appealing to individual taste, which is interchangeable with other forms of postmodern

architecture.[24] In this respect, the vernacular form is only one of the products to be consumed in the pursuit of subjective desires. It is supposed to evoke particular images in individuals, and direct them towards endless mass consumption. In its construction process, Neo-vernacular no longer requires community design, but has to reconstruct vernacular forms by means of professional design. Its construction does not rely on craftsmen's skills, which are replaced by advanced technologies that enable continuous mass production. It is obvious that Neo-vernacular architecture is satisfying "material production" as a societal need. Yet, current housing design has lost its ability to serve human needs. For users, the personal pursuit of desires no longer seeks the unified definition of art. Schizophrenic subjectivity exists without relationships to others or to society, and finds ways of expressing its sense of value in postmodern design.[25] This personalised aesthetics no longer seeks a synthetic relationship with science and technology.

This condition of architecture in current capitalist society is also summarised by Habermas' "rationalisation complexities". As Figure 3 shows, art and science in current architecture exist separately, rather than in creative fusion. Various architectural forms have no more meaning than to cultivate individual desires, and can be produced anywhere without concern about material supplies and construction techniques because they are available through international trade. Only a consensus between "art" as architecture and "science and technology" as building would be sought in order to sustain "material production" in an economic sense by pursuing new design that will satisfy endless individual desires, and by creating alternative architectural technologies to aid construction. This condition of architecture as a separation epitomises current society.

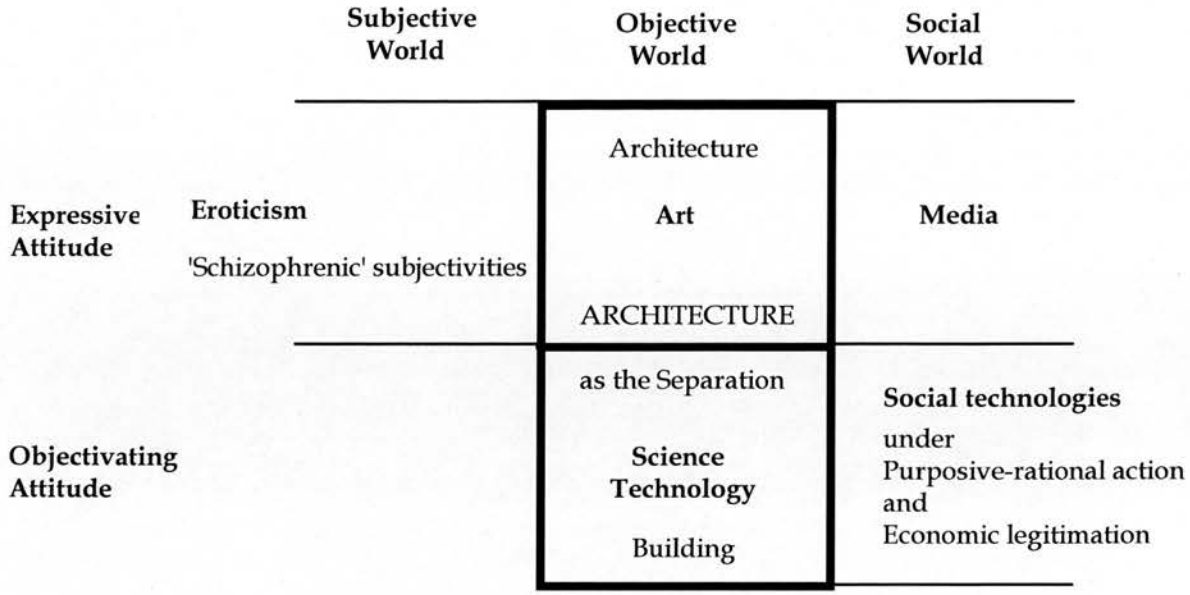


Figure 3: Architecture in late capitalist society

Source: Jürgen Habermas, The Theory of Communicative Action, Volume 1: Reason and the Rationalisation of Society, trans. Thomas McCarthy (Cambridge: Polity Press, 1987) p. 238.

Observing this postmodern condition of architecture as described above, the architects' role, which was supposed to consist in creating a fusion of art and science satisfying users' needs, has been shifting primarily towards satisfying the societal need for "material production". Yet, in facing the current architectural crisis, architects should not only seek the sustainability of economic activities. Nan Ellin at Arizona State University claims that the role of architects is moving from "physical/structural/formal design" towards the inclusion of "policy/system/social/experiential design". Her argument shows that alternative roles challenge the concept of architecture as a commodity to be consumed symbolically.[26] She also discusses the change of the architectural profession:

> "All of changes in training, practice, theory, and criticism — both immediate and long-term — must re-evaluate the measure of success in the architectural profession, to elevate goals such as contributing to environmental sustainability, preserving cultural traditions while nurturing growth and change, and improving living standards for the greatest number, over goals defined in terms of prestige, power and profits."[27]

Her criticism offers a significant point for re-directing architectural design from its economic value towards social and ecological values. Also, architects should not inscribe their own identities by

creating superficial images of architecture. Their professional attitude should be to investigate what users claim they need beyond mere desires, and discover solutions that satisfy both user and societal needs through practical design processes.

Through this argument, the two aspects of existence and design in architecture reveal the different need claims, which are sought by two different groups of people: users and architects. Design projects are based on their communication, which could be defined on two levels: horizontal and vertical. Horizontal communication is within each of the two constituencies seeking common need claims. Vertical communication is sought between the two groups, developing a consensus between the two groups' different attitudes and concerns. Doyal and Gough claim:

> "The only criterion for evaluating social systems which we are advocating thus far is: How far do they enable individual basic needs to be met?"[28]

Each user and architect not only seek to satisfy their own needs exclusively through design projects, but also to pursue communication, thereby establishing their identities. In this way, housing becomes a medium for evaluating social systems and its own sustainability in this thesis. The theoretical framework of the two need claims and the two ways of communication is shown in Figure 4.

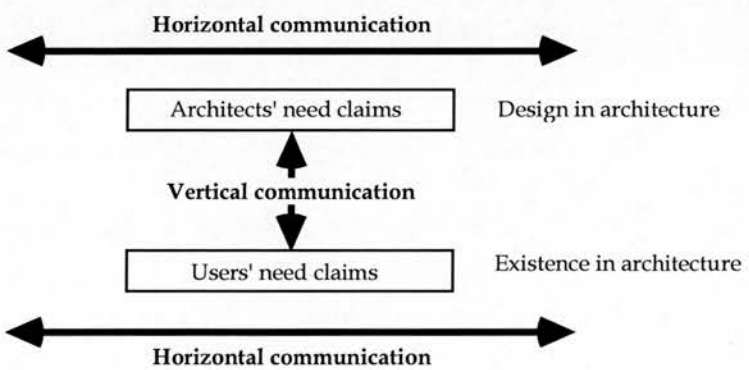


Figure 4: A theoretical framework of the need claims and the communication in architectural design

1.2 From critique towards reconstructing sustainability

The definition of architecture as the satisfaction of human needs will be applied to the concept of sustainability. As Figure 5 shows, a comprehensive definition of sustainability is proposed by Peter Bartelmus, an economist, who defines it as the combination of "supply/origin" and "use/destination". The former corresponds to design in architecture as the economic aspect, and the latter represents the users' viewpoints. In supply/origin, sustainability consists of three parallel factors: natural processes, economy, and socio-political processes. Economic sustainability is defined as the maintenance of produced capital, which relies on consuming natural capital. In facing the natural capital shortage and the increasing need to reduce its consumption and recycle waste, the global economy is required to abandon the simple pursuit of maximum economic profits. The physical aspect of sustainability can be found between the conflict of economic and ecological sustainabilities. Socio-political processes deal with the maintenance of human capital: labour, skill, and knowledge, and with the maintenance of institutional capital. The three sub-sustainabilities, ecological, economic, and socio-political, have to sustain physical and non-physical supplies that meet societal demands, as well as sustain themselves. These are summarised in the left half of the figure. On the other hand, in sustainability of use/destination, there are two types of welfare: economic and human, both of which are derived from the three sustainabilities of supply/origin. Economic welfare concerns "potential claims on final uses of goods and services". Human welfare is derived from non-economic goods and services "for the satisfaction of other human needs and aspirations".[29] Users' conditions are assessed in terms of the indicators mentioned in the right half of the figure. Yet, they define only the quantifiable aspect, because the qualitative aspect implied in daily life cannot be taken into account, thus leaving ambiguities in its definition. It is therefore necessary to create another definitive concept in the sustainability of use/destination. Here I shall call the latter definition of the sustainability of use/destination "spiritual sustainability", which focuses on human psychological needs and the quality of life rather than on standards of living defined in terms of quantitative evaluations.[30] Through the exemplification of housing design, this thesis will develop a concrete argument on spiritual sustainability that satisfies the quality of life.

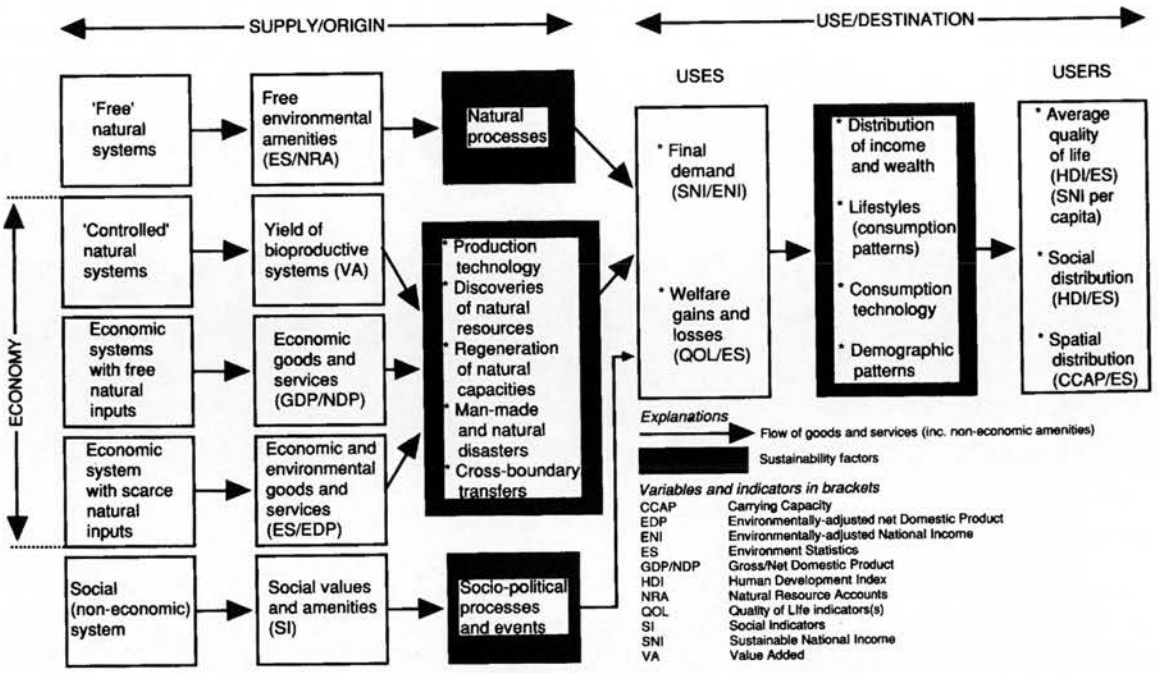


Figure 5: Sustainability and welfare generation

Source: Peter Bartelmus, Environment, Growth and Development: The Concepts and Strategies of Sustainability (London: Routledge, 1994), p. 62.

Apart from the sustainability of use/destination sought by users, spiritual sustainability will be sought by architects in order to gratify their professional identity. Architects' creativity is equivalent to their spiritual sustainability, not only in their concern for users' needs, but also for satisfying their own needs. Because the two need claims of users and architects are juxtaposed with housing design as shown in Figure 4, the two spiritual sustainabilities will be revealed through vertical communication, which is a central argument of the sustainability of housing in this thesis.

When architecture is built from human needs developed from spiritual sustainability, the ecological aspect cannot be its primary purpose. In Doyal and Gough's theory of human needs, ecological sustainability is separated from both human and societal needs. Their argument is based on the idea that human beings can justify protection of the ecosystem in order to sustain a form of life, if such protection is for the good of mankind and should continue to future generations.

> "Human needs, therefore, are those levels of health and autonomy which should be — to the extent that they can be — achieved for all people now, without compromising the foreseeable

levels at which they will be achieved by future generations. In the long term — if there is to be one - an awareness of the delicacy of the biosphere must go hand in hand with any feasible commitment to the optimisation of need-satisfaction."[31]

This clearly shows the anthropocentric approach towards global environmental issues. Since my argument focuses on the self that looks into social systems, this anthropocentric position serves as my point of departure. However, this does not signify a denial of either the technocentric or ecocentric approach. Their respective premises are suspended, and they should be reassessed according to the requirement of human needs. Each of the approaches, or combinations thereof, should be applied according to social conditions, which will enable them to guarantee autonomy or individual identity. The self, as the central concern in this thesis, will be explored in these different historical contexts, through which an alternative equilibrium among individuals, society, and environment will be sought in the sustainability of housing design.

---

1 See: Len Doyal and Ian Gough, A Theory of Human Need (London: Macmillan, 1991). Also, see: Len Doyal and Ian Gough, "Human Needs and Social Change", in Key Concepts in Critical Theory: Ecology, ed. Carolyin Merchant (New Jersey: Humanities Press, 1994).

2 See: Introduction.

3 See: Introduction.

4 Len Doyal and Ian Gough, "Human Needs and Social Change", in Key Concepts in Critical Theory: Ecology, ed. Carolyin Merchant, pp. 108-110.

5 William Richard Lethaby, Architecture, Nature and Magic (London: Gerald Duckworth, 1956), p.146.

6 See: Vitruvius, The Ten Books on Architecture, trans. Morris Hicky Morgan (New York: Dover Publications, 1960), pp. 13-6. Concerning human needs, Vitruvius claims:

> "...dwellings are to be provided according to their special needs: and, in a ward, the proper form of economy must be observed in building houses for each and every class".

Also, see: Hanno-Walter Kruft, A History on Architectural Theory: From Vitruvius to the Present, trans. Ronald Taylor, Elsie Callander and Antony Wood (New York: Zwemmer, 1994), pp. 21-9. Vitruvius divides venustas from the six basic concepts, which are summarised in the three groups:

1. The various aspects of the proportion of a building.
2. The artistic design.
3. The appropriate use of the Orders and the relationship between house and occupant.

These reveal that his comprehension of "beauty" implies both pure and practical arts.

7 Gottfried Semper, The Four Elements of Architecture and Other Writings, trans. Harry Francis Mallgrave and Wolfgang Herrmann (Cambridge: Cambridge University Press, 1989), pp. 101-4.

8 William Richard Lethaby, Architecture: An Introduction to the History and Theory of the Art of Building (London: Oxford University Press, 1955), p. 9.

9 Colin St John Wilson, The Other Tradition of Modern Architecture: The Uncompleted Project (London: Academy Editions, 1995), pp. 39-45. Wilson explains the fusion of "art" and "science" by quoting Classical Greek philosophy:

> "...the Classical ethos requires of architectural design a strict linear sequence that proceeds from the discovery of what is desirable to the invention of an appropriate form and thence to the elaboration of the technical means that make it possible. Pursuing that living sequence it can bring a form of life to its full identity for the first time, vivid and memorable".

10 Jürgen Habermas, The Theory of Communicative Action, Volume 1: Reason and the

Rationaliation of Society, trans. Thomas McCarthy (Cambridge: Polity Press, 1987) pp, 233-42.

11 Jürgen Habermas, The Theory of Communicative Action, Volume 1: Reason and the Rationalisation of Society, pp. 233-42. The three types of rationality are summarised as follows:

1. Cognitive-instrumental rationality:
   The production of knowledge can take the form of scientific and technical progress (including social technologies).
2. Moral-practical rationality:
   The production of knowledge can take the form of a systematic treatment of legal and moral representation.
3. Aesthetic-practical rationality:
   The production of knowledge can take the form of authentic interpretations of needs; interpretations that have to be renewed in each historically changed set of circumstances.

The three rationalities show that the three basic attitudes and the relationship among them constitute the rationality of society. This rationality indicates that they oppose each other. If one rationality dominates, the others diminish. The rationality of a society, therefore, is described by this balance among the three rationalities.

12 According to Oxford Latin Dictionary (Oxford: The Clarendon Press, 1982), "venus" means:

1. A goddess of Italian origin identified by the Romans with Aphrodite, and thus goddess of sexual love and generation.
2. The quality of attracting sexual love.

Also, in A Latin Dictionary (Oxford: The Clarendon Press, 1979), it is defined as:

"Loveliness, comeliness, charm, grace, beauty, elegance, attractiveness of the body."

13 See: Vitruvius, The Ten Books on Architecture, p. 16. Concerning economy, Vitruvius claims:

"Economy denotes the proper management of materials and of site, as well as thrifty balancing of cost and common sense in the construction works. This will be observed if, in the first place, the architect does not demand things which cannot be found or made ready without great expense".

14 Eduardo E. Lozano, Community Design and the Culture of Cities: The Crossroad and the Wall (Cambridge: Cambridge University Press, 1990), pp. 14-5.

15 Eduardo E. Lozano, Community Design and the Culture of Cities: The Crossroad and the Wall, p. 17.

16 Eduardo E. Lozano, Community Design and the Culture of Cities: The Crossroad and the Wall, p. 21.

17 See: Victor Papanek, The Green Imperative: Ecology and Ethics in Design and Architecture (London: Thames and Hudson, 1995), pp. 113-38.

18 Jürgen Habermas, Toward a Rational Society: Student Protest, Science and Politics, trans. Jeremy J. Shapiro (Cambridge: Polity Press, 1987), pp. 91-5. He explains traditional society as follows:

"The expression "traditional society" refers to the circumstance that the institutional framework is grounded in the unquestionable underpinning of legitimation constituted by mythical, religious or metaphysical interpretations of reality - cosmic as well as social - as a whole".

The institutional framework, based on "ordinary language", dominates subsystems of "purposive-rational action" technically ruled and defined in terms of "context-free language". Society is legitimated by the "prevalence of a central world view" of myth and religion, and is delivered by "intersubjectively shared ordinary language".

19 Jürgen Habermas, Toward a Rational Society: Student Protest, Science and Politics, pp. 97-9.

20 Colin St John Wilson, The Other Tradition of Modern Architecture: The Uncompleted Project, p. 44.

21 David Harvey, The Condition of Postmodernity: An Enquiry into the Origin of Cultural Change (Cambridge, MA: Blackwell, 1990), p. 60.

22 Arne Naess, Ecology, Community and Lifestyle: Outline of an Ecosophy, trans. David Rothenberg (Cambridge: Cambridge University Press, 1989), pp. 84-5.

23 Jürgen Habermas, Toward a Rational Society: Student Protest, Science and Politics, p. 99. As Habermas observes, current society has established "subjective belief systems and ethics which ensure private cogency of modern value-orientations".

24 Charles A. Jencks, The Language of Post-modern Architecture: Fifth Revised Enlarged Edition (London: Academy Editions, 1987), pp. 96-103.

25 Fredric Jameson, "The Cultural Logic of Late Capitalism", in Rethinking Architecture: A Reader in Cultural Theory, ed. Neil Leach (London: Routledge, 1997), pp. 241-2. Fredric Jameson calls this individual mindset the "schizophrenic" structure in which people temporarily seek the aesthetics that are partly produced by new technologies.

26 Jusuck Koh's argument is quoted by Nan Ellin, Postmodern Urbanism (Cambridge, MA: Blackwell, 1996), p. 231.

27 Nan Ellin, Postmodern Urbanism, p. 234.

28 Len Doyal and Ian Gough, "Human Needs and Social Change", in Key Concepts in Critical Theory: Ecology, ed. Carolyin Merchant, p. 110.

29 Peter Bartelmus, Environment, Growth and Development : The Concepts and Strategies of Sustainability (London: Routledge, 1994), pp. 61-5.

30 See: Introduction. I call this "spiritual" sustainability because it corresponds to the three distinctions of Guattari's ecology: "spiritual", or "subjective" ecology, "social" ecology" and "environmental" ecology. Consequently, the other two ecologies of "society" and "environment" correspond to the sustainability of supply/destination.

31 Len Doyal and Ian Gough, A Theory of Human Need, pp.145-6.

CHAPTER 2:

Regional Framework: A Critical Analysis

The definitions of the region and its relationship to housing have been changing historically as mentioned in Chapter 1. The transition through the three chronological sequences of traditional, modern, and postmodern shows the discontinuity of existence and design in housing. This discontinuity can be symbolised by the changing definitions of the region, from its practical sense in traditional society towards the linguistic sense in postmodern society, which implies shifting socio-economic conditions.

In current society, sustainability of housing cannot be sought simply within a traditional sense of the region. Regional boundaries have become ambiguous due to technological developments in transportation and to increasing international trade. Consequently, the geographical definition is becoming less significant.[1] The search for an alternative housing design framework will involve redefining the region according to the needs that individuals feel in their daily lives rather than the needs determined by the region in a geographical sense. In this framework, securing the autonomous position of the self will be necessary and also fundamental to developing housing sustainability.

2.1 Patrick Geddes

The focus on the self in a regional context is not a new concept, but it is rooted in modern planning theories rather than being defined in architectural design. When alternatives to traditional social forms were demanded by the increasing power of industry, Sir Patrick Geddes (1854-1932) created a new vision of modern society as the extension of empirical knowledge in traditional society. His theory was also derived from modern science, which was the most powerful manifestation of hope and ambition of that age. His stance as a generalist comes from his multidimensional interest in the natural and social sciences, which he brings together to achieve his great ambition: "organism". In Geddesian theory, citizens are at the centre not only for evaluation and observation, but also for creating a city. In this process, Geddes as a planner has only the role of a catalyst who encourages citizens to move forward in evolving their cities. As represented by evolution understood in a biological sense, the

region Geddes observes is continuous from traditional society to his age of modernity.

2.1.1 Patrick Geddes' "Notation of Life"

It is difficult to comprehend and paraphrase the Geddesian concept because of the diversity of the fields he considered and their complex interrelationships. However, it can be said that his thought is summarised in the concept of "Life", as delineated in his last book, a co-authored work entitled Life. Geddes contributed the last two chapters to this volume, whose other author was the biologist J. Arthur Thomson, and whose year of publication was 1931, just one year before Geddes' death.[2]

The book presents a diagram called "Classification of Sciences".[3] As shown in Figure 1, the sciences are situated at the bottom, and proceeding vertically from them are "mathematics" and "physics and chemistry" and "biology". They are topped at the summit by "sociology" as the most complex of the sciences, which derives solutions for its own problems from the lower sciences.[4] Yet, the natural and social sciences remain interdependent. Geddes' comprehensive definition of sociology can be understood from this classification based on scientific positivism.

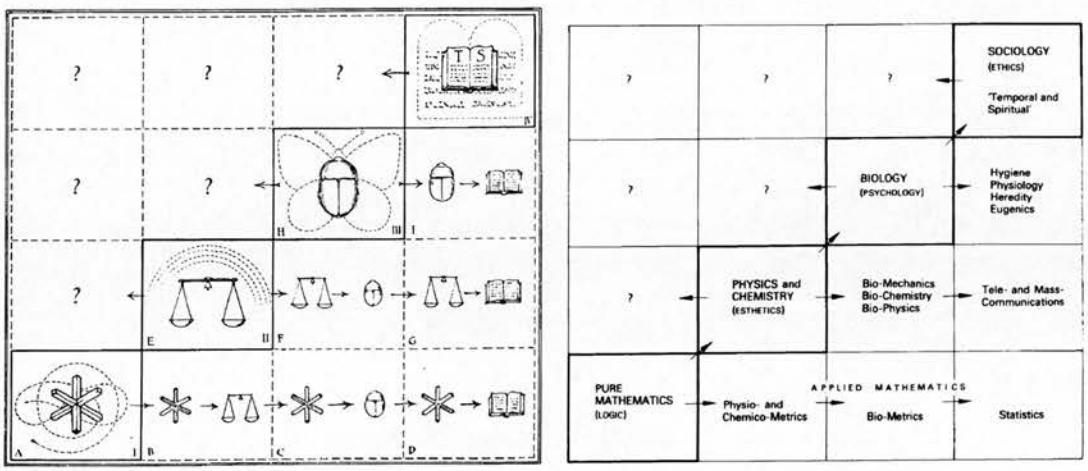


Figure 1: Classification of the Sciences

Source: Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior (London: Routledge & Kegan Paul, 1978), pp. 465-8.

Noting the lack of concern that the city planning theory of his age had for the city and the community, Geddes proposed a comprehensive survey of the "place" by applying the observational methods of the natural sciences.[5] The survey of "place" is based on a region defined by the section of a river valley, the "Valley Section" shown in Figure 2.[6] Here he defines the region only as a model for

the survey in which a number of "places" are situated. With the Valley Section, he describes the relationship between geographic characteristics and land use in different valley sections throughout Europe. It not only includes a monographic survey of life in terms of "economy", but also takes into account the re-constructive potential of "anthropology". "geography", "economy" and "anthropology" are based on the three concepts of "place", "work" and "folk" in the Geddesian sociological formula, each of which is derived from "environment", "condition", and "organism" in the biological sciences.[7]

Figure 2: The Valley Section and the basic occupations

Source: Amelia Defries, The Interpreter Geddes: the Man and his Gospel (London: George Routledge & Sons, 1927), p. 73.

Based on "place", "work" and "folk", Geddes develops the so-called "Notation of Life" that is one of the "Thinking Machines", and proposes it in the explanatory diagrams in Civics: As Concrete and Applied Sociology, Part II, written in 1905.[8] As shown in Figure 3, the Notation of Life diagram comprises four concepts of life: "Acts": the simple practical life, "Facts": the simple mental life, "Dreams": the full inner life and "Deeds": the full effective life. Through the successive cycle of the four parts of life in this order, the city and its inhabitants evolve towards the ultimate goal of their synthesis.[9]

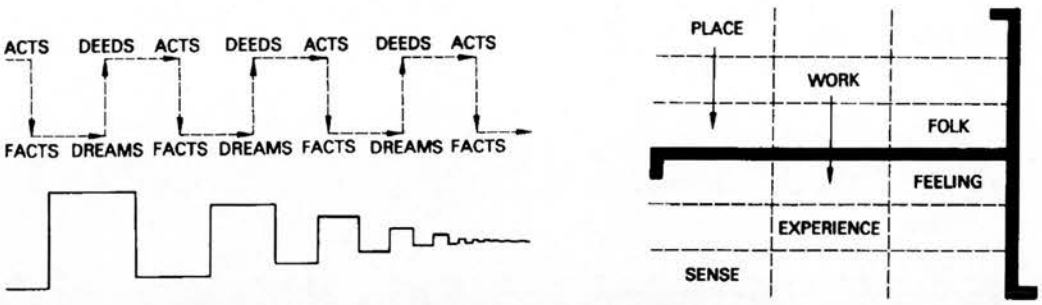


Figure 3: The process of the evolution of city: "Acts" and "Facts" correspond

Source: Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior (London: Routledge & Kegan Paul, 1978), pp. 469-70.

Geddes uses metaphorically "Town" for "Acts" as the first part of life, by which he means the comprehension by both the natural and social sciences of human activities in "Town" through the theoretical development from biology to sociology. The three formulas of "place", "work" and "folk" together with the six correlated conditions (place-WORK, place-FOLK, work-PLACE, work-FOLK, folk-PLACE, folk-WORK) create the nine squares of the matrix. This matrix of "Acts" is applied to the following "Facts", "Dreams" and "Deeds", creating a total of 9 x 4 = 36 squares in the complete diagram shown in Figure 4. In the "Acts" matrix, each square corresponds to another in the nine-square matrix by rotating at right angles anticlockwise at the centre of the figure.

"Facts" followed by "Acts" focuses on the psychology of the subjective world. Geddes claims that the survey is not meant only to discover the technical facts and data of the "Town" ("Acts"), but also to develop the individual consciousness of the place in daily life.[10] Each "place", "work" and "folk" is perceived by individuals as "sense", "experience", and "feeling". Another name that Geddes uses for this stage is "School", where individuals learn the conditions of the "Town" through their respective perceptions. Still, "School" not only contributes to accumulating the knowledge of the place, but also leads actions based on what the individuals learned from "Facts". What Geddes develops at the next stage is a more constructive and critical analysis of life — "Dreams": the full inner life.[11] In "Dreams", he envisages transcending the collective individual perceptions of the place towards "the whole human world of sympathy", which Geddes crystallises in the word "Cloister". Each "sense", "experience" and "feeling" in "Facts" is sublimated to "emotion" (ideals), "ideation" (ideas) and "imagination" (imaginary), which are explored as "good", "true" and "beautiful".[12] This synthesised consciousness in the transcendent world offers a means of criticising and reflecting upon the

conventional practical activities of "Acts". The criticism gives individuals a strong motivation for taking actions leading to the common goal of the city.

Through the three stages of life, "Deeds", which Geddes calls "City", emerges as the realisation of an alternative world that is built according to "Dreams". Yet, as the words "the full effective life" show, "City" means not only a physical phenomenon but also represents the "ideals of human relationship" towards a "theory of the universe and man".[13] Geddes' intention is to create a path from individual perception towards the development of a political argument. For example, collective "feeling" in "Facts" develops a common "emotion" in "Dreams", which manifests itself as "etho-polity". Also, "ideas" followed by "experience" becomes "synergy". Physically, "integration" derived from individual "sense" creates "nature and architecture" in "place".[14] This alternative manifestation of "City" returns to the first practical life of "Town" as a status quo, continuing the process of the city's evolution in an endless Hegelian spiral.

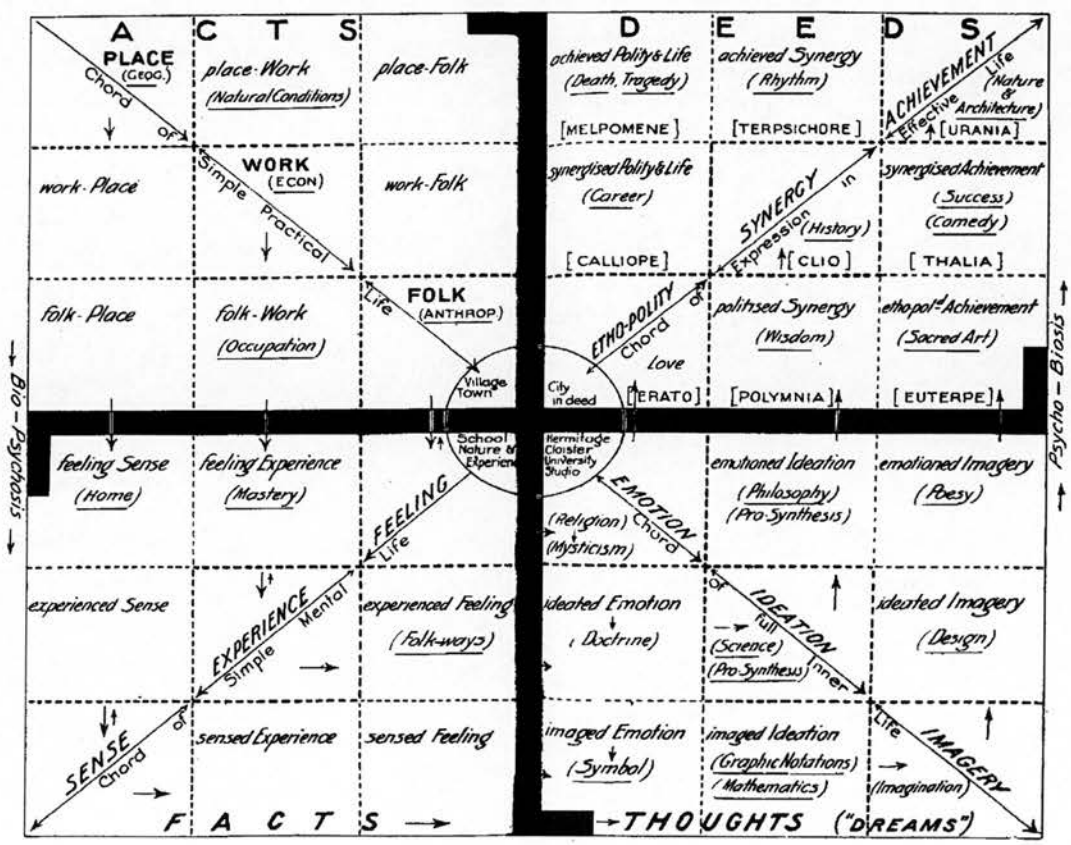


Figure 4: The Notation of Life

Amelia Defries, The Interpreter Geddes: the Man and his Gospel (London: George Routledge & Sons, 1927), pp. 146-7.

It can be said that the Notation of Life describes the communication of the different worlds: from the subjective, the social, and the objective towards the transcendent world, all interacting with each other in an evolutionary process. Through this process one is able to seek the single goal of the four worlds, through which the individual consciousness of the region developed in "Facts" has a significant role for creating alternative "Dreams".

2.2 The transition from the modern planning theory towards the current context

As represented by Geddes' work, modern regional planning proposes a shift from the traditional and pre-industrial sense of the region. At the same time, the current domination of technical language in planning theories and in the undervalued ordinary language that individuals use in daily life can be found in the modern positivists' views. Applying Geddes' theory as a modern project to the current context reveals two significant issues. One is that the planners' goal for society is set differently from the citizens' goal. The common view of society that they share no longer has the premise that Geddes envisaged. The other point is that the dominant professional attitude in current planning processes has been separating the citizens from the processes. The following discussion shows how the consequence of progressively separating the positions of the citizens from those of the planners in the planning process is exemplified by the shift from Geddes' theory towards the work of Arther Glikson and some other planners.

2.2.1 The identical view and the dual view

Geddesian theory reveals the common view of citizens and planners. In the Notation of Life, individuals are motivated emotionally to create the citizens who are conscious of the region where they belong. Geddes intended to involve the citizens directly as the manpower for improving the city in the planning process through interaction with the planners' decision-making process. The roles of planners and governments are to optimise the regional potential, which is synchronised with the citizens' motivation. Both planners and citizens seek the same goal of equilibrium between man and nature in society. Their decision-making is supposed to be identical in constructing common regional opinions.

In researching citizen participation in planning, Michael Fagence points out the significance of Geddes as:

> "He (Geddes) remarks upon three means of involvement: involvement by education through public exhibitions, active participation in the collection of information, and involvement by offering alternative planning solutions and proposals to those of the planning authority or its consultants...
> Geddes' proposition was that the scope be extended to capture the interest and imagination of wide sections of the community, even if, in so doing, it resulted in pondering some of the particular causes of well-intentioned community groups. Such action, Geddes suggested, would be likely to engender a sympathetic public attitude towards the conduct of planning by giving expression to community matters, and by revealing the context of constraints and opportunities which effectively give shape to planning proposals".[15]

A post-Geddes example of applying the Notation of Life is the work of Arther Glikson. In his book Regional Planning and Development published in 1953, Glikson develops Geddes' Notation of Life for his own framework for the regional planning process.[16] Although the Geddesian Notation of Life consists of the fourfold process of "Acts", "Facts", "Dreams" and "Deeds", Glikson's framework focuses only on the "Acts" of the place-work-folk matrix as the practical aspect of regions. As shown in Figure 5, Glikson's framework starts by accumulating "Basic Past" (natural science) and "Historic Past" (social science) towards their synthesis in the "Present Cultural Landscape", which leads to "Planned Action". This follows the Geddesian classification of sciences from natural science towards the complexities of social science. Succeeding to the Geddesian positivist position, the synthesis of the natural and social sciences in Glikson's planning process is accepted as self-evident. Yet, this leads to the one-through process without interacting with individuals and their consciousness of the place.[17] This interpretation is one of the origins of separating individuals from regional planning processes.

Table 1 shows a detailed comparative summary of the two theories with a focus on "Acts". Glikson defines the details to be investigated in each of "place", "work", "folk" and their combinations, in contrast with Geddes' contribution to developing a planning outline. This increasing significance of scientific data based on various professional surveys is crucial for regional planning.

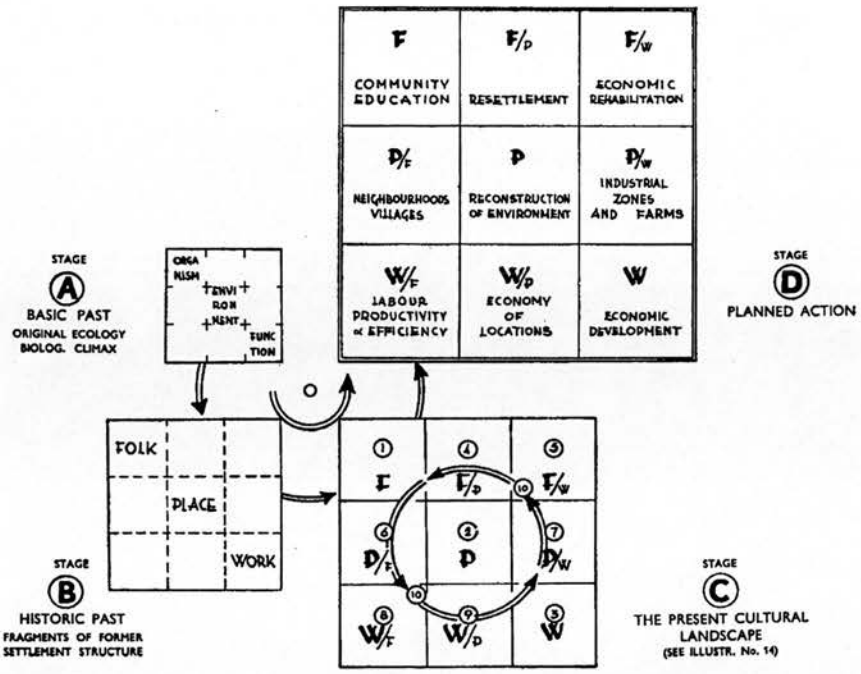


Figure 5: Theoretical Outline of Stages and the Main Subjects of the Survey and Planning of Regions Using Geddes' Notation of Life

Sources: Arthur Glikson, Regional Planning and Development: Six Lectures Delivered at the Institute of Social Studies, at the Hague, 1953 (The Hague: Leiden, 1955), p. 83.

	Arthur Glikson	Patrick Geddes
Folk	-Sociological and demographic data -Region's population	-Anthropology
Place	-Topography, drainage basins, climate, geology, water resources, soils, etc.	-Geography
Work	-Region's economic potential	-Economy
FOLK/place	-The influence of spatial factors on the life of society, i.e., population distribution	-Dwellings in different places
FOLK/work	-The impact of occupations, economic structure, and regional situation on the population	-Occupation
PLACE/folk	-Modifying the geography of the region by social influences, e.g., land use (residential, recreational, social, administrative)	-Natives, neighbours
PLACE/work	-The influence of economic activities on the map of the region, e.g., land use for economic purposes	-"Natural advantages" which determine work of each kind at the right place for it
WORK/folk	-The economic situation and prospects of the region in view of the size, features, and qualifications of its population	-Workers
WORK/place	-The types of production and employment made possible by spatial conditions	-Fields, factories
Circulation	-Processes that maintain the region's vitality -The flows of people, goods, energy, water, and telecommunications	-Evolution of cities

Table 1: Comparison of the Thinking Machines by Geddes and Glikson

Sources: Arthur Glikson, Regional Planning and Development: Six Lectures Delivered at the Institute of Social Studies, at the Hague, 1953 (The Hague: Leiden, 1955), pp. 70-85.

Patrick Geddes, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Meller, Helen (Leicester: Leicester University Press, 1979), pp. 148-55.

The relationship of interaction between the technical language derived from the surveys at "Acts" and the ordinary language perceived by individuals at "Facts" and described through the Geddesian Notation of Life, has been absorbed into the technical language of professional planners, who are committed to maintaining the man-nature equilibrium in the region as Glikson alternatively defined it. Individuals are no longer expected to be citizens with the power to improve their own living places actively, but merely to passively submit to professional decision-making. This professional-based comprehension of Geddesian theory also can be seen in Lewis Mumford's process of planning, which is shown in Table 2. Even though Mumford's Notation of Life comprises four stages as conceived by Geddes, each of their meanings is simplified so as to assume the form of planners' views based on professional thinking, which does not concern individual emotions.

Lewis Mumford	Patrick Geddes
Survey	Acts (Town)
Evaluation	Facts (School)
Plan proper	Dreams (Cloister)
Final Stage	Deeds (City)

Table 2: Comparison of the planning processes of Geddes and Mumford

Source: Volker M. Welter, Arthur Glikson, "Thinking Machines", and the Planning of Israel (The City after Patrick Geddes: International Symposium, 8-10 May, 1998)

In recent planning theories, Fagence points to Geddes' Notation of Life as one of the roots of the modern regional process. Yet, his comprehension of the Geddesian model of the planning process that is the same as Mumford's Survey-Analysis-Plan has with an ambiguous relationship between individuals and planners. Also, the individual perception of the region is no longer elevated towards creating a new society. Contrasting the Geddesian Notation of Life, Fagence summarises some different models of planning methodology (Lichfield (1968), Travis (1969), Kozlowski (1970), Roberts (1974), McConnell (1969), McDonald (1969) and DOE (1971).[18] Most models clearly distinguish between the role of individuals and that of planners, which shows the differences between their positions and viewpoints. As a result, planners — as professionals — require far more complicated processes than those of Geddes. This duality of individuals and planners can be commonly found in current planning theory.

2.2.2 From "modernisation theory" to "dependency theory"

The individual/planner duality observed in current planning theory is one of the major factors obstructing the satisfaction of human needs. Between the two groups of people there are gaps that still remain in planning and raise another issue: Is it possible for individuals to be empowered in the planning process in order to satisfy their own needs? Currently, Cliff Hague has been researching the transition of city planning in the Edinburgh of Geddes' day, and criticises the planners for pursuing the interests of capital by means of technical change through professional city planning. The planners "lack a coherent image of the kind of city that they are trying to create". The ambiguous planning process inevitably leads itself to chaos, which is destroying not only the opportunities for individuals to be involved in decision-making, but also to share a common image of the city with professionals.[19]

In analysing the transition from modern to postmodern planning theories, John Abbott summarises the relationship between individuals and planners in two ways: "modernisation theory" and "dependency theory". "Modernisation theory" assumes a shift from the primitive and traditional society towards modern society, through which the primary goal of economic growth can be guaranteed. Based on this principle, community participation is given a place in planning theory in order to "create conditions of economic and social progress for the whole community".[20]

Of the two types of their relationship, Geddesian theory will be categorised as a "modernisation theory". In his vision of modern industrial society, which is harmonised with man and nature, community participation is presupposed to seek the same goal as the individual, and to promote various economic activities by optimising the natural potential of the region. The Acts-Facts process in the Notation of Life indicates only the premised process of individual perception. The individual envisages the synthesis of the information derived from the planners' objective survey (Acts) and the subjective perception of "place" (Facts) in a positivist's sense. But for this premised identical view from "Acts" to "Facts" to reach an identical goal in "Dreams", the individual perception of the region has to be imprinted by scientific knowledge rather than being developed critically from the self and its needs. As a result, this restriction of the individual's potential causes two serious problems in planning theory. One is that the common goal sought by planners cannot always be identical to community interests. When a community's sense of values contradicts planners' intentions, it could be undervalued by dominating professionalism and its technical language. The other is that professional

decision-making cannot always reconcile itself with the different interests of different groups of people because there is no premise for an absolute answer in planning.[21]

Abbott uses the term "dependency theory" for alternative theory that no longer pursues the primary goal of economic growth, although various social values and different interests are allowed to exist simultaneously in a society. When the duality of planners and individuals is premised in the theory, it is crucial for individuals to evaluate planners' technical language with their own ordinary language. Instead of expecting "community development" that presumes economic growth, the "empowerment" of the community is pursued to satisfy individual needs.[22] The relationship between the two theories and their approaches to community participation is summarised in Figure 6.

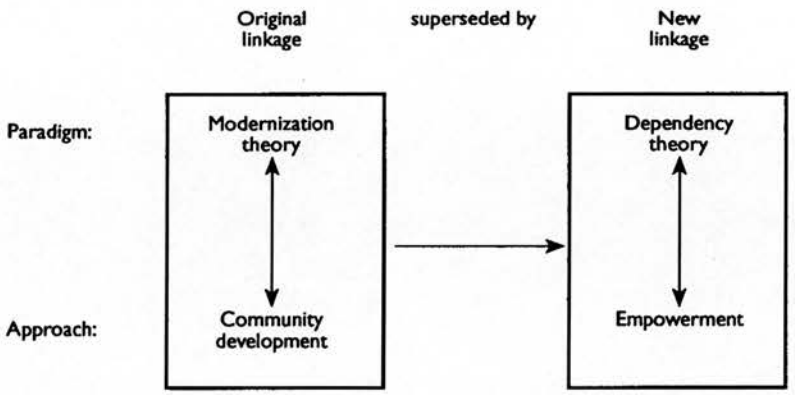


Figure 6: The paradigm approach model of community participation

Source: John Abbott, Sharing the City: Community Participation in Urban Management (London: Earthscan, 1996), p. 21.

Currently, the increasing significance of community participation in city planning can be observed as one of the trends towards dependency theory. In a historical context, Paul Saleman notes the concept of "citizenship", which has been shifting from "political citizenship" within the framework of the battle between right and left, towards "social citizenship" that exists beyond ideological debates. It represents the empowerment of the local community and its citizens against the domination of political and economic forces. Also, community participation should have a different motivation from the national interests defined by political economy. "Environmental citizenship" is emerging as one of the key points for developing and satisfying the common interests of the community.[23] In international bodies such as the United Nations, one of the significant roles of the self in relation to sustainable city

planning is represented by the word "inclusiveness". This means that involving the members of the community in the planning process will make them conscious of their own living place, thus leading them to take direct action towards improvements for a better living environment.[24] Current Japanese arguments resonate with dependency theory in that the individual's sense of value is to be empowered in the planning process. For example, Waseda University's Hiroshi Mimura points out that one of the main objectives of Japanese city planning is to involve the citizens in the planning process. He claims that city planning should be defined primarily as a social system to support and empower the citizens.[25] They play the leading role in perceiving and criticising the current condition of the city, and on that basis they participate in creating alternative visions for the future and act according to their self-consciousness. From a historical position, Hidetsugu Kobayashi at Hokkaido University summarises the transition of Japanese planning theory from the domination of rationalism and functionalism towards the concerns of the subjective perception of place. His argument is based on the three chronological views of place: the premodern view of mysticism and religions, the modern rational view, and the current subjective view. Individuals and community activities should be involved in the planning process through reinstituting communication among the sense of values held by the three views of place.[26]

Despite the increasing significance of the individual sense of value, public involvement is not intended to replace current social systems with an alternative structure. It only provides an opportunity for each individual to evaluate professional activity in terms of one's own sense. The positions of individuals and planners will never be identical. Yet, based on their different positions and social responsibilities, planning should take place while sustaining tension between them.

Through the arguments on the modernisation and dependency theories, Geddes' Notation of Life, as the former, has lost currency as a planning theory. The idea of planners and individuals having identical views is no longer applicable to current society. Yet, in dependency theory the Notation of Life could be re-evaluated as a process for empowering individuals through discovering one's own sense of value without assuming a synthesis with the planners' sense of value. This confirmation of the individual's position makes the following argument concentrate on small goals in daily life, as Geddes focused on places on a scale that each individual can perceive, rather than directly inquiring into a region or a city as a whole from a planner's point of view. In this respect, the creation of

housing, which symbolises various human needs, would be one of the practical goals in living space. This establishes housing as a medium for individuals to evaluate socioeconomic systems in terms of their needs in daily life.

2.3 A critical inquiry of defining the region

> "If any central principle of critical regionalism can be isolated, then it is surely a commitment to place rather than space ,..".
>
> Kenneth Frampton[27]

In the current debate between the ecologists and the economists, the concept of the region has a significant meaning. For ecologists, the region is a fundamental unit within which various energies and resources are recycled sustainably. Unique techniques are developed to sustain daily life by optimising available resources. However, it should be rather obvious that this comprehension of the region cannot be accepted by economists who claim that current fundamental socio-political systems rely on international relationships.

To find an answer to this endless debate, dependency theory, as noted previously, provides an alternative definition focusing on the individual's point of view. Although the region has lost its spatial significance because of increasing international trade, its meaning could be reconstructed by extending the individual's perception of the place where he or she lives. In housing design, the trend of increasing international trade and importing various housing technologies for higher standards of living makes architects and builders aware that their jobs are threatened.

2.3.1 Scale

Ecologists claim that regional scale is a fundamental unit for creating equilibrium between human activities and natural production. One of the conspicuous examples of this argument is seen in bioregionalism. The word bioregionalism is derived from "bio" in Greek, meaning "forms of life", and "regere", the Latin word for "the territory to be ruled". Bioregionalism, which has Geddesian theory as one of its roots, was first advocated by Peter Berg and Raymond Dasmann in the 1970s, although it is not clear who originated the term. Recently it has emerged as one of the practical

methodologies for ecocentric philosophy, such as deep ecology.[28] According to ecologist Kirkpatrick Sale, bioregionalism is defined by the following four points:

1. Knowing the land,
2. Learning the lore,
3. Developing the potential,
4. Liberating the self.

Following Sales' definition, a region simultaneously embraces three subsets:

1. Ecoregion: The widest natural region, taking its character from the broadest distribution of native vegetation and soil types.
2. Georegion: smaller bioregions identified by clear physiographic features such as river basins and valleys of a major river system.
3. Morphoregion: The smallest regions identifiable by distinctive life forms on the surface, such as towns, cities, mines and factories, or fields and farms.

The four concepts defining bioregionalism can be found as the juxtaposition of the three scales and types of the sub-regions.[29]

This regional trend emerged in the 1960s against the post-war urbanism of the United States, in which both people and nature were exploited. One response was a revived interest in vernacular architecture that refers to the past (historicism) and the locale and site (regionalism). Lewis Mumford claims this exclusive definition of the region, which is confrontational to post-war capitalist society, as one of the theoretical roots of bioregionalism. Bioregionalism has succeeded to his thought and his confrontational attitude. It starts from a "region" whose goal is "stability" and "self-sufficiency", and inevitably leads to an "anti-industrio-scientific" paradigm, which can be seen in the contrast between bioregional and industrio-scientific paradigms in Table 3.[30]

Under each of their paradigms, however, unique human needs are not taken into account, or their satisfaction given priority. Restricted human potential and manipulated human needs will be epitomised negatively in the design of housing within each paradigm. In the bioregional paradigm, housing would be built according to a community design using a self-sufficient regional material supply with design and construction techniques passed down from previous generations. Architectural

forms strengthen the traditional institutional framework for the sake of harmonising sociopolitical sustainability with ecological sustainability. In the industrio-scientific paradigm, on the other hand, housing design requires technological developments, which secure its continuous demands for higher standards of living. This guarantees economic sustainability as its primary concern. Yet, in both cases, a self-reflective attitude is absorbed into the premised knowledge in each of the two paradigms without being questioned. As a result, this restricts human potential to inquiring into people's senses of value from an individual point of view.

The problem of the endless conflicts between ecologists and economists can be seen from their exclusive attitudes and social value claims.[31] Not only do the conflicts remain unsolved, but also the self is kept out of the debates because the conditions for the self and subjectivity are premised within each social system.

BIOREGIONAL PARADIGM	INDUSTRIO-SCIENTIFIC PARADIGM
Region	State
Community	Nation/World
Conservation	Exploitation
Stability	Change/Progress
Self-sufficiency	World Economy
Cupertino	Competition
Decentralisation	Centralisation
Complementarity	Hierarchy
Diversity	Uniformity
Symbiosis	Polarisation
Evolution	Growth/Violence
Division	Monoculture

Table 3: Comparison of the paradigm of bioregionalism

Source: Kirkpatrick Sale, Dwellers in the Land: The Bioregional Vision (San Francisco: Sierra Club Books, 1985), p. 50.

An alternative comprehension of the region should be acquired through an inquiry into the self, primarily identifying individual unique needs, rather than simply allowing them to be determined by external environments and by artificially created information. One example is critical regionalism, which emerged by separating itself from the confrontational regionalism of the 1980s. Kenneth Frampton distinguishes Critical regionalism from "the simplistic evocation of a sentimental or ironic vernacular," then goes on to say,

> "... [critical regionalism] self-consciously seeks to deconstruct universal modernism in terms of values and images which are locally cultivated, while at the same time adulterating these autonomous elements with paradigms drawn from alien sources".[32]

Alexander Tzonis and Liane Lefaivre also claim:

> '"Critical" here does not connote a "confrontational" attitude only. After all, as we have seen, Mumford's post war regionalism was confrontational with respect to the facadist, anomic, atopic modernism, and the attitude of romantic nineteenth-century regionalists was in open rebellion against the "imperialist" spread of the classical canon. But this does not necessarily make them critical in the more specialised sense we now apply, that is as a regionalism that is self-examining, self-questioning, self-evaluating, that not only is confrontational with regard to the world but to itself'.[33]

They suggest separating themselves from the exclusive attitude in conventional regionalism and to redirecting them towards the self and a self-reflective attitude. Autonomy of housing design will be sought through redirecting design from its economic-industrial sense towards an existence that takes account of users' needs, and developing an alternative way of evaluating current society from their viewpoints. Regional scale is no longer defined geographically, and should be reconstructed using each individual's sense and the intention.

This current direction of regional planning will be used to re-evaluate Geddesian theory, which may be seen as offering a bridge between the modern and postmodern ages. This belief is shared by Geddes' modern society and by current society. Geddes supports the self-reflective comprehension of the region. In the Notation of Life, the process from "Acts" to "Facts" guarantees the development of a self-reflective attitude, rather than a motivation from based on confrontational factors. The region that Geddes describes as the web of "places" will diminish the ultimate definition of the region, allowing individuals to comprehend one of the scales temporally existing between "place" and "universe".[34]

2.3.2 Technology

The economist-ecologist debates have revealed their different attitudes to regional scale, which will influence the definition of technology in a region. In Geddes' Notation of Life, the relationship between regional scale and technology could correspond to "place-WORK" as "natural advantages which determine work of each kind at the right place for it"[35]. Geddes' comprehension of "place-WORK" means developing the potential of the land, which is represented in the Valley Section, which

has been shown in Figure 2. In descending order along the river stream, miners, woodsmen, hunters, shepherds, crofters, farmers and fishers are linked physically with the characteristics of the land. These primitive occupations, through the development and differentiation of the modern age, become more complicated. Yet, the basic principle is retained for the effective use of energies and resources that optimise the potential of the "place", and extend it to regional planning.[36] As Geddes insists:

> "... to dissipate the national energies,... is not economics but Waste; and that to go on dissipating energies for the sake of this or that individual percentage on the transaction, is no longer to be approved as "development of resources", as the mendacious euphemism for it goes, but is sternly to be discouraged, as the national waste, the mischievous public housekeeping it has been all along".[37]

This argument will lead to the re-definition of "work", separated from an economic sense. As envisaged by Geddes in "Cities in Evolution", the shift from "Paleotechnic" to "Neotechnic" in the use of natural resources has to be managed carefully and effectively, based on the observation of "place" and the synchronisation of technologies. He criticises the "Paleotechnic" economy of his age, in which the accumulation of private "money" in banks indicates wealth, and proposes a shift toward the "neotechnic" economy, in which wealth is defined as the accumulation of natural resources based on their careful "economisation".[38]

Similarly, in bioregionalism, economy is defined as:

> "... an economy that depended upon a minimum number of goods and the minimum amount of environmental disruption along with the maximum use of renewable resources and the maximum use of human labour and ingenuity".[39]

This extends the argument "place-WORK" towards "work-PLACE" — design in housing as the place for working. In the context of labour, deep ecology also argues that "maximum use" and "ingenuity" are an ecological philosophy regarded as a meta-theory of bioregionalism. Deep ecologists Bill Devall and George Sessions assess a given technology more clearly as follows:

> 1. "How meaningful, capable of variations, conductive to the self-determination and inventiveness of the worker is it"?

2. "Does it strengthen cooperation and harmonious togetherness with other workers"?[40]

These questions proclaim the fundamental conviction of both bioregionalists and deep ecologists that technologies should be chosen in terms of the development of human potentials such as skill, creativity, and co-operation. These contribute to satisfying basic human needs for working more than do the societal needs of economic efficiency. Geddes also criticises work defined in terms of the "money wages" of the Paleotechnic order. The neotechnic order calls for:

> "... skill directed by life towards life, and for life. He, the working man, as in all true cities of the past, aristo-democratised into productive citizen - he will set his mind towards house building and town planning, even towards city design".[41]

The term "neotechnic" focuses not only on the physical aspects of the economy such as energy efficiency and the wealth of natural resources. It also concerns itself with the mental aspects, in which creative living can develop a consciousness of the living environment, consequently focusing human skills on the goal of general social improvement. The Geddesian concept of neotechnic economy or "work" criticises the "dissipation of energies" and the "deterioration of life" in the paleotechnic economy, and proposes the two relationships between "place" and "work": "place-WORK" as the relationship with natural resources and "work-PLACE" as the relationship with human resources in connection with working conditions. Optimising regional potential must therefore be sought from these two resources. When "place-WORK" is emphasised only for the sake of ecological sustainability based on a confrontational attitude, it will fail to overcome the conflicts with economic sustainability. Alternatively, the significance of basic human needs in relationship to technology is revealed in "work-PLACE". This critical attitude makes it possible to give people the chief position in questioning social values, rather than allowing them to be dominated by the premised rationality.

2.3.3 Defining the region from human needs

In summarising this section, the self seeks an alternative development of regional scale and technology, and inquires into social values through a self-reflective attitude. As Geddes combines the three elements: "place", "work" and "folk", one could seek a definition of the region based on the living place, corresponding to "folk-PLACE". In daily life in the "folk-PLACE", human needs "at

home" are revealed differently according to the individual. Also, technology in housing design is not only defined from "place-WORK", thus optimising regional natural resources and pursuing economic profits, but is also extended towards "work-PLACE", thus focusing on human needs "at work". In housing design, these two human needs at home and at work correspond to two groups of people, users and architects/builders, each of which concerns existence and design in housing.

2.4 Updating the Notation of Life

Having confirmed the Notation of Life as a design process at the individual level, each of the four stages "Acts", "Facts", "Dreams", and "Deeds" will be examined by turns in detail. The practical process of housing design will be developed through a consensus between users and architects based on their vertical relationship.[42] However, since each develops its unique need claims at home and at work in the same design process, there is no guarantee that their attitudes will lead to the same kind of decision-making. In other words, unless both users' and architects' needs are sought in housing design, it will be difficult to satisfy the needs of both simultaneously. The Notation of Life is premised on a consensus among an assemblage of need claims, which is still a crucial issue to updating the modernists' project in the current context of communication.

This argument parallels the current debates on creating consensus in postmodern society, especially debates like those between Habermas and Lyotard. Habermas claims that consensus in current society can be reconstructed through communication as an extension of the modernists' project. On the other hand, in criticising Habermas' argument, Lyotard points out his two assumptions.

> "The first is that it is possible for all speakers to come to agreement on which rules or metaprescriptions are universally valid for language games, when it is clear that language games are heteromorphous, subject to heterogeneous sets of pragmatic rules. The second assumption is that the goal of dialogue is consensus. But,... consensus is only a particular state of discussion, not its end. Its end, on the contrary, is paralogy".[43]

Lyotard makes his argument with "paralogy", in which there is no reason for premising the possibilities of developing a consensus in postmodern society. His argument directs criticism at Habermas' search for a universal consensus through communicative agreement.[44] The process of

updating the Notation of Life, therefore, is an attempt to discover one possible answer to this debate on consensus in the particular context of housing design.

2.4.1 Creation of consensus

> "... what is meant by the term knowledge is not only a set of denotative statements, far from it. It also includes notation of "know-how", "knowing how to live", "knowing how to listen"... Knowledge, then, is a question of competence that goes beyond the simple determination and application of the criterion of truth, extending to the determination and application of criteria of efficiency (technical qualification), of justice and/or happiness (ethical wisdom), of the beauty of a sound or colour (auditory and visual sensibility), etc".
>
> Jean-François Lyotard[45]

Knowledge cannot be developed only through accumulating information, according to how Lyotard distinguishes "knowledge" from "learning". In criticising the modern project, the self must take back the central position for inquiring into social values. In updating the Notation of Life, the individual attitude towards developing knowledge is the starting point for this argument. The individuals in "Facts" perceive "Acts" uniquely as practical life, and express their perception in "Dreams", showing the cycle of developing knowledge. The architectural theorist, Christian Norberg-Schulz defines perception as the subjects' "immediate awareness of the phenomenal world" and as the information on which they might act in an appropriate way. The perception is expressed in unique words by each individual, thereby enabling a group of people to communicate with each other. It is the only way for the perception to reveal itself.[46] Yet, in this process, any consensus among the collective expressions cannot be premised. As Lyotard claims, we can no longer expect to have a universal consensus in postmodern society that starts from "a recognition of the heteromorphous nature of language games".[47] In other words, the expressed languages are separated from the perception of reality, and are seeking their own rhetoric within language itself. This condition can be found easily in the current endless language games taking place in the media, and their influences on individual decision-making.

Yet, this does not completely deny the Habermasian theory of communication and the possibilities for consensus. When Lyotard's argument is restricted to perceiving the real place rather than

information as a whole, possibilities of reconstructing consensus among the people integrated into that place will increase. Housing design, as the way of making decisions for concrete action, could provide a common platform for aggregating people's different need claims in order to satisfy each of them. A possible consensus would be sought by incorporating their own attitudes for designing housing. In this respect, housing could be a medium for social communication through its physical construction rather than accelerating linguistic consumption. Although housing is created temporally and locally, consensus could be sought through practical activities among the people involved in the project.

The development of the following argument is based on this hypothetical definition of housing as a possible platform for developing a consensus between clients and architects.

2.4.2 From Personal towards Grand Narratives

When the perceptions of individuals are expressed in words, the language is called "narratives". They are derived from individual perceptions. In contrast with the technical language of science, narratives are expression by individuals of their needs in their own language. Narrative knowledge is rooted in traditional society and in the inherited sense of value within the institutional framework. Narratives claim their legitimation from the narrators who were at first the listeners. The self is established within the narratives without inquiring into the value claims they imply. This transmission is the basic condition of narrative knowledge.[48]

Yet, when current narratives are significant for developing a self-reflective attitude rather than for passing on empirical knowledge as the absolute criteria, they must provide alternative criteria for judging current society according to individual's sense of value. This type of narrative is called "personal narrative", defined by Ruth Finnegan a sociologist as follows:

> "When we read personal narratives of this kind, we are, it seems, brought right to a most personal point in contemporary culture: individual experience. This "individual experience" will turn out to be more complex than it may seem at first sight. But it should be clear at least that, in personal stories, we are not focusing on formal structure, mass media or large-scale institutions and industries, but the everyday experience of ordinary individuals as they formulate it in their own words".[49]

The narrators, who create the stories through their own lives, develop legitimacy of the self and its

need claims with their personal narratives. Having confirmed their own position with the narratives, individuals can evaluate the conditions of current society. In other words, individuals are allowed to reconstruct their identity in current society by creating their narratives.

Yet, personal narratives do not always emerge exclusively without any common ground: some similar characteristics are identified in its emerging processes. This means that subjective expressions in the form of the personal narratives could be extended towards an intersubjective expression. It can be shared within a group of people who have a common historical background. For example, Finnegan points out the two types of narrative patterns. Each of them is derived from "the motif of continuity from the past" and "some personal avocations or principles". The former is recounted from the narrators' roots and family history. The personal narratives could mean the evolutionary process of their society and the continuity from past to present, rather than seeking a revolutionary shift by denying the past, or accepting changes blindly imposed by technological developments. Through the process of developing residents' narratives in Fishermead in Milton Keynes, Finnegan reveals personal narratives:

> "The overwhelming impression was of the richness of the individual and differing personalities and of their formulation in narrative... (E)ach story in its way represented its own personality and unique experience. It conveys the voice of a thinking individual who, through personal memories and verbal articulation at one point in time, conveyed some sense of expressing meaning, of creating coherence, of somehow controlling and enunciating a distinctive place in the universe".[50]

On the other hand, the latter pattern is recounted with particular conviction and given a "quasi-mystic" flavour, such as music, sport, or religious adherence.[51] In a regional context, voluntary actions rooted in common faith such as protecting natural resources and inheriting the traditional culture could be categorised as this pattern. These collective individual strong wills, rather than their common relationship with a particular place, could synchronise with one another, and some develop voluntary associations.

Reconstructions of common perceptions of a place will lead its residents towards not only developing a narrative that is shared among them, but also using it as alternative criteria for evaluating society with a commonly developed sense of value. This is called a grand narrative, which could

develop an intersubjective sense of value. In current society, one of the examples can be seen in the development of "bioregional narratives", which are described by Jim Cheney a philosopher as follows:

> "The fractured identities of postmodernism... can build health and well-being by means of a bioregional contextualisation of self and community. The voice of health will be various and multiple as the landscapes which give rise to them - landscapes which function as metaphors of self and community and figure into these mythical narratives which give voice to the emergence of self and community. The notion of socially constructed selves gives way to the idea of bioregionally constructed selves and communities. In this way, bioregionalism can 'ground' the construction of self and community without the essentialisation and totalisation typical of the various "groundings" of patriarchal culture".[52]

"Bioregional narratives" aim to reconstruct the lost grand narratives in postmodern society. Yet, each narrative no longer premises its exclusive sense of value, but only emerges as a result of developing consensus as an inter-personal narrative among a group of people. The philosopher Arran E. Gare proposes two concepts of narratives: monological narratives, and polyphonic and dialogical narratives. Monological narratives are seen in modern narratives, which are supposed to unify collective individual needs as society's goal in a positivist sense, by assimilating scientific knowledge and narrative knowledge. The collapse of the positivist project gave way to the polyphonic and dialogical narratives, which are based on the plurality of individual needs, and develop an indirect relationship between people, each of whom is seeking his or her own goals and needs. In this sense, the grand narrative exists as a medium among the different personal narratives.[53]

Now that the narratives have been argued in personal, inter-personal, and grand context, the Notation of Life could be re-defined as the process of reconstructing them. Geddesian narrative knowledge emerges as "poesy" and "design" in "Dreams", followed by the individual perceptions of places in "Facts". For users, the personal histories that could be a foundation for individual decision-making would be extended to the concept of "poesy". For architects and the builders, the stories of supplying housing materials, the construction techniques, and the forms would be implied in "design". Yet the existence of the two narratives in housing design does not provide any reasons to confirm for us the existence of the grand narratives. Yet, housing design, which is implemented in a specific place

and in a specific context, is chosen as an example of examining possibilities for creating collective personal narratives in design process. In observing architecture as a language that tells various stories, housing could be defined as a manifestation of two stories: those of users and of architects/builders. Although they are mutually exclusive and cannot expect monological narratives, there may be created a polyphonic and dialogical relationship in which design and existence in housing provide opportunities for satisfying various senses of value that are narrated in different stories so as to communicate and interact with one another. Based on such a definition of housing, let us inquire into the two personal narratives of "design" and "place".

2.4.3 "Poesy" and "Design"

"...poetically man dwells..."

Inquiring into this phrase in a part of a poem by Hölderlin, Heidegger asserts that:

> "Poetry is what first brings man onto the earth, making him belong to it, and thus brings him into dwelling".[54]

"Poesy", which is set as the extension of "folk-PLACE" in the Notation of Life, is no longer the realm of fantasy. As Heidegger's words show, man dwells through this linguistic expression. In this sense, "poesy" is a form of the personal narrative, which expresses the individual's perception of the place where he or she lives. It is not restricted to its aesthetic sense as literature. "Poesy" is explored under the assumption that it represents the aesthetics of "place", revealing the significant role of "measure-taking". Heidegger continues:

> "To write poetry is measure-taking, understood in the strict sense of the word, by which man first receives the measure for the breadth of his".[55]

"Measure-taking" does not mean quantitative measure taking, but consists of mysterious meanings, which cannot be fully revealed. In the domination of scientific knowledge, ordinary language, which is not always quantitatively measured, tends to be undervalued. Yet, poesy is a more subjectively based contemplation of life, in terms of ordinary language. At the same time, it shows the limitation of scientific knowledge based on technical rules. Geddes' concept of "poesy" in the Notation of Life also

could be explored critically using Heidegger's poetical measure-taking as the antithesis of the currently dominant scientific measure. The existence of personal narratives guarantees the autonomous position of individuals free from any restrictions.

Moreover, poetry not only contributes to developing personal narratives as subjective expression, but also extends towards the inter-personal narrative. As the philosopher Gaston Bachelard claims, the poetics of space as the expression of subjective and transsubjective images, "poesy" as a personal expression through perceiving a place, could be shared among the people who perceive the same place.[56] This communication based on a specific spatial context could be one of the ways to develop the ground narratives.

"Poesy", which started from "folk-PLACE", is extended towards "design" as "work-PLACE", projecting its measure-taking into practice.

> "Authentic building occurs so far as there are poets, such poets as take the measure for architecture, the structure of dwelling".[57]

As the phrase "poetically, man dwells" represents, poetry builds up man's dwelling on the earth linguistically rather than practically. Building defined as "letting-dwell" reveals the existence of "poetry" as a linguistic sense within the practical process of housing design. Also, poetry means the admission of dwelling that consequently gives a measure-taking for building. In this respect, the practical sense of design is also not always determined in terms of scientific knowledge, but will be measured through dwelling poetically. In such a way, "poesy" not only shows the personal expressions of users, but could be a medium for communicating with architects/builders in order to physically realise this linguistic construction as housing.

Apart from the definition of "design" as the extension of "poesy", "design" makes more practical sense of "work-PLACE" for architects and builders. Yet, this practical sense should not primarily confine them within the pursuit of economic sustainability, but should be concerned with their own needs as professionals. Manfred A. Max-Neef an economist focused on human needs for evaluating economic activities, and sought their optimisation as alternative parameters for economy.[58] He defines "design" as something that satisfies the human need for "creation", through which people can develop their social identities.[59] According to Max-Neef, "design" is comprehended as a "satisfier" of the

"doing of creation" as one of the categories of the human need for "being, having, doing and interacting of creation" which are summarised in Table 4. As shown in the Notation of Life, "design" as the "Dreams" of architects/builders could fail to reveal various need claims through a whole design process. Alternatively, "creation" could possibly be a word that represents a more comprehensive definition of professionals' needs. In the following arguments, the word "design" in the Notation of Life is used as a synonym for the human need "creation" defined by Max-Neef, implying the various satisfiers mentioned in the table.

Human needs	Satisfiers
Being of creation	Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity
Having of creation	Abilities, skills, method, work
Doing of creation	Work, invent, build, design, compose, interpret
Interacting of creation	Productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom

Table 4: Human needs and their satisfiers

Source: Manfred A. Max-Neef, Human Scale Development: Conception, Application and Further Reflections (London: The Apex Press, 1991), p. 32.

2.5 Towards applying the Notation of Life

In the original idea of the Notation of Life, Geddes' work could have a strong impact on creating the citizens who interact with one another, and developing sympathy with the region. This significance at an individual level rather than as a planning theory has been having an influence on environmental education. The Japanese sociologist Tomoni Sajima claims Geddes as a root of current environmental education for the following reasons. In his own era, Geddes contributed to emancipating conventional education, which oppresses individual instinct and intuition within a traditional way of thinking, and working towards developing a unique perception of a living world with emotion. This perception has been applied not only to mere environmental studies, but is also used as a basis for public participation in planning processes for people to create their own living places. This education has been developing autonomous individuals who not only have knowledge of

their regions, but also know how to live in accordance with what they have learned, thereby exhibiting a self-reflective attitude.[60]

The Notation of Life is no longer the general process used as planning theory in current society, but could be seen as Geddes' personal view of "place". At the same time, this view is not fixed, but is changing endlessly, accumulating various senses, feelings, and experiences. This definition will allow his theory to be identified as a process of personal change. From a psychological point of view, a positive change in people's own lifestyle could be made "as a result of their own efforts or in conjunction with therapists and other change agents".[61] For example, "the Satir Model" by the psychotherapist Virginia Satir shows the six stages of the spiral process. The "Status Quo" of the individual perception of "pain" and "unbalance" (State 1) makes individuals realise the issues of "fear" and "anxiety" (Stage 3), which leads to a new integration (Stage 4) strengthened by practice (Stage 5). This process goes back to a "New Status Quo" (Stage 6).[62]

If these arguments are applied to the design process, the Notation of Life may be seen as a process of change that makes people into creative individuals. It would be possible to identify some similarities between this model and the Notation of Life, such as the structure, from identifying current conditions that create the capacity for change towards completing an alternatively integrated vision through practice and its spiral processes. This, however, does not insure the significance of the Notation of Life from a psychological point of view. It would be only one example of leading individuals towards a significant "change" in the environment and themselves. This process of the updated Notation of Life is the guideline for the following arguments of the study, which applies each of the four stages step by step.

---

1 See: Chapter 1.
2 Patrick Geddes and Arthur J. Thomson, Life: Outline of General biology (London: Williams & Norgate, 1931).
3 It is influenced by August Comte's sociology, modified by Herbert Spencer's version of classification.
4 Patrick Geddes and Arthur J. Thomson, Life: Outline of General biology, pp. 1302-4.
5 Patrick Geddes, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Helen Meller (Leichester University Press, 1979), pp. 124-5.
6 Patrick Geddes and Arthur J. Thomson, Life: Outline of General biology, p. 1396.
7 Patrick Geddes, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Helen Meller, pp. 136-7.
8 Patrick Geddes, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Helen Meller.
9 Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior (London: Routledge & Kegan Paul, 1978), pp. 465-75.

10 Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior, pp. 138-40.

11 Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior, p. 149. Geddes finds that this procedure from "Town" to "School" is rather "deterministic", which tends to lead individuals towards only a materialistic and regulative interpretation. The individual perception of issues in daily life results only in reactions to particular issues without optimising the potential of "Facts" as a whole.

12 Patrick Geddes, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Helen Meller, pp. 148-55.

13 Amelia Defries, The Interpreter Geddes: the Man and his Gospel (London: George Routledge &Sons, 1927), p. 151.

14 Philip Boardman, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior, p. 472.

15 Michael Fagence, Citizen Participation in Planning (Oxford: Pergamon Press, 1977), p. 102.

16 Arthur Glikson, Regional Planning and Development: Six Lectures Delivered at the Institute of Social Studies, at the Hague, 1953 (The Hague: Leiden, 1955), pp. 70-85.

17 Volker M. Welter, Arthur Glikson, "Thinking Machines", and the Planning of Israel (The City after Patrick Geddes: International Symposium, 8-10 May, 1998).

18 Michael Fagence, Citizen Participation in Planning, pp. 100-12.

19 Cliff Hague, The Development of Planning Thought: A critical perspective (London: Hutchinson, 1984), pp. 318-28.

20 John Abbott, Sharing the City: Community Participation in Urban Management (London: Earthscan, 1996), pp. 12-17.

21 See: John Abbott, Sharing the City: Community Participation in Urban Management. Abbot also points out the limitation of community development in modernisation theory.

22 John Abbott, Sharing the City: Community Participation in Urban Management, pp. 17-20.

23 Paul Saleman, Local Sustainability: Managing and Planning Ecologically Sound Places (London: Paul Chapman, 1996), pp. 145-9.

24 Richard Gilbert, Don Steveson, Herbert Girardet and Richard Stren, Making Cities Work: The Role of Local Authorities in the Urban Environment (London: Earthscan, 1996), pp. 29-30.

25 Hiroshi Mimura, Chiiki Kyosei no Toshi Keikaku [City Planning for Regional Symbiosis] (Tokyo: Gakugei Suppansya, 1997), p. 146.

26 Hidetsugu Kobayashi, "Sustainable na Jukankyo wo Mokuhyotosuru Keikaku no Wakugumi" [Planning Framework towards a Sustainable Living Environment] in Syo Toshi no Redesign System ni Kansuru Keikakuteki Kenkyu (Heisei 8 Nendo Kagaku Kenkyuhi Hojokin Kenkyuseika Hokokusyo, 1997), pp. 88-91.

27 Kenneth Frampton, "Prospects for a Critical Regionalism", in Theorising a New Agenda for Architecture: an Anthology of Architectural Theory 1965-1995, ed. Kate Nesbitt (New York: Princeton Architectural Press, 1996), p. 481.

28 Arne Naess, Ecology, Community and Lifestyle: outline of an Ecosophy, trans. David Rothenberg (Cambridge: Cambridge University Press, 1989), pp. 87-8. Bill Devall and George Sessions, Deep Ecology (Salt Lake City: Gibbs Smith, 1985), p. 70. According to Arne Naess and environmentalist George Sessions, a platform of the deep ecology movement is summarised by the following:

(1) The flourishing of human and non-human life on Earth has intrinsic value. The value of non-human life forms is independent of the usefulness these may have for narrow human purposes.
(2) Richness and diversity of life forms are values in themselves and contribute to the flourishing of human and non-human life on Earth.
(3) Humans have no right to reduce this richness and diversity except to satisfy vital needs.
(4) Present human interference with the non-human world is excessive, and the situation is rapidly worsening.
(5) The flourishing of human life and culture is compatible with a substantial decrease of the human population. The flourishing of non-human life requires such a decrease.
(6) Significant change of life conditions for the better requires a change in policies. These affect basic economic, technological, and ideological structures.
(7) The ideological change is mainly that of appreciating life quality (dwelling in situations of intrinsic value) rather than adhering to a high standard of living. There will be a profound

awareness of the difference between big and great.

(8) Those who subscribe to the foregoing points have an obligation directly or indirectly to participate in the attempt to implement the necessary changes.

29 See: Kirkpatrick Sale, Dwellers in the Land: The Bioregional Vision (San Francisco: Sierra Club Books, 1985).

30 Kirkpatrick Sale, Dwellers in the Land: The Bioregional Vision, p. 50.

31 See: Chapter 1

32 Kenneth Frampton, "Prospects for a Critical Regionalism", in Theorising a New Agenda for Architecture: an Anthology of Architectural Theory 1965-1995, ed. Kate Nesbitt, p. 472.

33 Alexander Tzonis and Liane Lefaivre, "Why Critical Regionalism Today?", in Theorising a New Agenda for Architecture: an Anthology of Architectural Theory 1965-1995, ed. Kate Nesbitt, p. 488.

34 See: Fumiaki Sato, "A Comparative Study of Regional Sustainability", in Journal of Architectural Planning, Environment and Engineering, pp. 191-6.

35 See: Table 2

36 Patrick Geddes and Arthur J. Thomson, Life: Outline of General biology, pp. 1395-7.

37 Patrick Geddes, Cities in Evolution (London: Ernest Benn Limited, 1968), p. 67.

38 Patrick Geddes, Cities in Evolution, pp. 62-70.

39 Kirkpatrick Sale, Dwellers in the Land: The Bioregional Vision, p. 69.

40 Bill Devall, and George Sessions, Deep Ecology (Salt Lake City: Peregrine Smith Books, 1985), p. 35.

41 Patrick Geddes, Cities in Evolution, p. 71.

42 On "vertical relationship", see: Chapter 1.

43 Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984), pp. 65-6.

44 On the debates between Habermas and Lyotard, see: Gregor McLennan, "The Enlightenment Project Revisited", in Modernity and Its Future, eds. Stuart Hall, David Held and Tony McGrew (Cambridge: Open University, 1992), pp. 327-77. Also, in Stanley Raffel, Habermas, Lyotard and the Concept of Justice (London: Macmillan Press, 1992), p. 5. Raffel claims that:

> "Lyotard criticises Habermas' work as a sort of last ditch and so, Lyotard believes, essentially old-fashioned, attempt to find some unifying principle - in the case of Habermas the principle he is mistakenly searching for being the communicative agreement among all the actors that we have identified as Habermas' essential goal. Lyotard suggests that such agreement is both unnecessary and even "terroristic", in the sense that it involves an unwarranted and unwanted imposition by one person (the theorist) of just his notion of what everyone should do, think, etc. So, he lumps Parsons, Marx, and Habermas all together as people who erroneously think there needs to be something that holds a society together."

45 Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, p. 18.

46 Christian Norberg-schulz, Intentions in Architecture, (Cambridge, MA: The MIT Press, 1968), pp. 27-9.

47 Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, p. 66. Lyotard claims that:

> "... any consensus on the rules defining a game and the "moves" playable within it must be local, in other words, agreed on by its present players and subject to eventual cancellation."

In this sense, a housing project is the 'local' situation for the consensus, while the designers, builders, and clients are considered to be the 'players'.

48 Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, p.20. Lyotard claims that:

> "... the narratives allow the society in which they are told, on the one hand, to define its criteria of competence and, on the other, to evaluate according to those criteria what is performed or can be performed within it."

49 Ruth Finnegan, "Storying the Self: Personal Narratives and Identity", in Consumption and Everyday Life, ed. Hugh Mackay (London: Sage Publications, 1997), p. 67.

50 Ruth Finnegan, "Storying the Self: Personal Narratives and Identity", in Consumption and Everyday Life, ed. Hugh Mackay, p. 81.

51 Ruth Finnegan, "Storying the Self: Personal Narratives and Identity", in Consumption and Everyday Life, ed. Hugh Mackay, pp. 80-5.

52 See: Arran E. Gare, Postmodernism and the Environmental Crisis (London: Routledge, 1995), p. 94. Gare quotes from Jim Chenery, "Postmodern environmental ethics: ethics as bioregional narrative", in Environmental Ethics (Vol. 11, Summer, 1989).

53 Arran E. Gare, Postmodernism and the Environmental Crisis, pp. 140-1.

54 Martin Heidegger, "... Poetically Man Dwells...", in Rethinking Architecture, ed. Neil Leach (London: Routledge, 1997), p. 112.

55 Martin Heidegger, "... Poetically Man Dwells...", in Rethinking Architecture, ed. Neil Leach, p. 114.

56 Gaston Bachelard, The Poetics of Space: the Classic Look at We experience Intimate Places (Boston: Beacon Press, 1994), xxii-xxiv.

57 Martin Heidegger, "... Poetically Man Dwells...", in Rethinking Architecture, ed. Neil Leach, p. 118.

58 See: Mark Lutz, "Living Economics in Perspective", in Real-life Economics, ed. Paul Ekins (London: Routledge, 1992), pp. 89-120.
On Max-Neef's human needs, see: Manfred A. Max-Neef, Human Scale Development: Conception, Application and Further Reflections (New York: The Apex Press, 1991).

59 Manfred A. Max-Neef, Human Scale Development: Conception, Application and Further Reflections (London: The Apex Press, 1991), p. 32.

60 Tomomi Sajima, Kansei to Ninshiki wo Sodateru Kankyo Kyoiku [Environmental Education for Fostering Sensibility and Consciousness] (Tokyo: Kyoiku Syuppan, 1996), pp. 15-7.

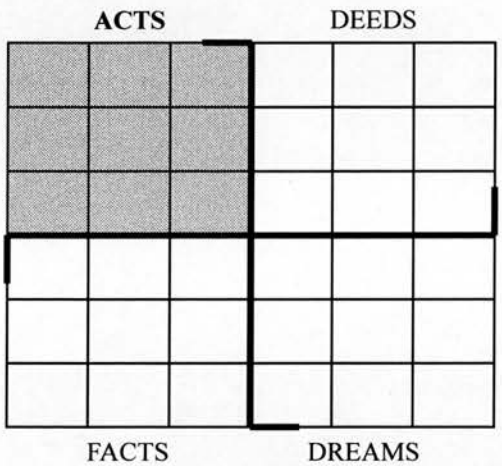
61 Stanley J. Gross, "The Process of Change: Variations on a Theme by Virginia Satir", in Journal of Humanistic Psychology (Vol. 34, No. 3, 1994), pp. 87-110.

62 See: Virginia Satir, The Satir Model: Family Therapy and Beyond (Palo Alto, CA: Science and Behavior Books, 1991).

CHAPTER 3:

"Acts":

Technocentrism and Postwar Japanese Housing



In the following discourse, Japanese housing is selected as an exemplary building type for inquiring into the relationship between sustainability and architecture. Wooden detached housing will be the main focus for the following reasons. First, detached housing is a building type that directly reflects the individual sense of value and decision-making through the design process. Second, wood is still the dominant building material for Japanese detached housing. Therefore in Japan wooden detached housing epitomises the current relationship among three ecologies: the subjective, the social, and the environmental.[1]

In categorising it as "Acts": the first stage of the Notation of Life, this chapter focuses on the three elements of geography, economy, and anthropology, which are extended to the ecological, economic, and sociopolitical sustainabilities of supply/origin in the context of housing.[2] With Japan as its geographical setting, the main argument will address the economic and sociopolitical influences on the CO_2 emissions that result from housing construction, use, and demolition. This multidimensional approach for inquiring into the sustainabilities of supply/origin will allow exploration of the issues not only from the aspect of the physical relationship between housing and emissions in terms of energy and material consumption, but also in the context of the political, economic, and social developments

in postwar Japan that strongly promote increasing consumption.

3.1 The historical context of architecture and technology

All modern societies exist in relationships with the past, and Japanese society is no exception. It sometimes rejects negative experiences, seeking alternatives from the antagonistic reaction. The mainstream of current housing design has rejected the knowledge and skills of the historical precedent, and is increasing its reliance on postwar technological developments. This condition is not only encouraged by the engineers who develop alternative technologies, but is also rooted deeply in government policies meant to redefine the Japanese identity after 1945. At the same time, the consequence of this postwar history has been serious discontinuity with prewar traditions and culture, which has spilled over into housing design.

3.1.1 The two modernisations of Japan

After the Meiji Restoration in 1868, which followed the collapse of the Tokugawa Shogunate, Western modernisation was the primary objective of the Meiji government. This caused one of the most crucial political divisions between traditional and modern Japan. The slogan of the Meiji period was "civilisation and enlightenment", which expressed its promotion of modern technological development and the emancipation of the people from Tokugawa federalism, yet still under the divine authority of the Japanese Emperor. This Meiji slogan was incorporated into governmental policy, serving as the ideological underpinning for building modern Japan's socioeconomic and industrial infrastructures. This led to massive demand for construction of the buildings for the new government, and for commerce, industry, and housing in order to create job opportunities. Such work was indispensable to the former samurai (warrior) class, the highest of the four-class social hierarchy in the Tokugawa period, to redirect them into industrial production.[3]

In spite of massive renovation, this shift did not lead to a drastic change in dwellings for most of the population. Although Western-style housing had shown a gradual increase since the beginning of the twentieth century, it was restricted to the elite. Ordinary people still lived in conventional housing, with "tatami" mat flooring rather than carpets. This shows that housing in the early twentieth century was still in the process of the physical transition from traditional to modern. Through contributing to

the modernisation of industry and the economy, the Meiji Restoration also confined the people under Japanese ultranationalism. J. Victor Koschmann a historian claims:

> "... ultranationalism of twentieth-century Japan had attempted to obliterate the distinction between the public and private worlds... As a result, under Japanese ultranationalism 'the personal, internal quality of private affairs could never be openly recognised', and no one, not even the emperor, could claim 'free, subjective awareness'."[4]

"Ultranationalism" had eliminated the division between individuals and the nation under the traditional Japanese religion of Shinto, advancing the nation towards war. Through the 1945 defeat in World War II, Japan probably experienced the strongest discontinuity in its history. The massive war-caused losses in every aspect of life damaged the national wealth that had been accumulating since the Meiji Restoration.[5] Postwar Japanese history is a history of rebuilding the whole country from ashes. During the postwar years, the United States distributed dollar funds under the Marshall Plan throughout Europe in order to aid the postwar recovery. Although Asian countries were excluded from the plan, American investments during the Korean War in the 1950s stimulated the economies of Japan other Asian countries. This was the first and a crucial opportunity for Japan to jump-start its industrial and economic recovery.[6] The result was described by the 1956 Economic White Paper thusly: "Japan is no longer in the postwar period", which was supposedly the official declaration that Japan had extricated itself from chaotic postwar conditions.[7]

The war damage that Japan suffered was not only physical, for it also mentally affected the Japanese by cutting them off from their past of a unified individual identity. The creation of a modern personality disjoined from ultranationalism was the first step towards a Japanese democratic revolution under the occupation policy of the United States.[8] Japanese modernisation was intended to emancipate the whole nation from the religious power of the Emperor that had supposedly been the foundation for leading the nation towards the war. This might be called another "enlightenment" coming after the Meiji Restoration.[9] While the Emperor had been believed to be the god in Shinto, after the war he became just the symbol of the state. The dominating power of militarism before and during the war was also redirected towards democratic policy, and postwar education was promoted by denying the past. However, it did not contribute to creating the autonomous self in the democratic

social system. Postwar Japan has been assimilated to American democracy — the material democracy whose premise is a national consensual will that mass production and consumption will lead to a higher standard of living. The new generation, which has grown up without being taught wartime Japanese history, cannot identify its roots within the prewar historical context. At the same time, people of that generation have not had enough opportunities to reflect on what happened during the war years. Instead, an alternative Japanese identity has been created by persuading them to believe in the "American way of life" as the ideal vision for modern Japanese society to pursue without hesitation. This material democracy has had a major impact on the individual sense of value in postwar Japan, redirecting the Japanese from a search for their identity in the historical context towards pursuing their desires by consuming products.[10]

The postwar demand for construction was far greater than that of the Meiji Restoration. Housing in particular was urgently needed because many homes had burned down in the onslaught of air raids during the war. Construction was also a significant economic boost. Construction and city development were synonymous with economic growth, and continue to be so even today. For architecture and urban planning, postwar Japan was a huge experimental site for applying modern architectural concepts, and the influence of the International Style, especially as represented by Le Corbusier, cannot be ignored. The Japanese architect Kunio Maekawa (1905-86), who worked for Le Corbusier, was the most influential architect in modern Japan. Influenced by Maekawa's knowledge, Kenzo Tange (1913-) became one of the most important persons in postwar Japanese architecture. Through his presentation at the eighth CIAM conference in 1951, Tange was recognised internationally for his interpretation of modern architecture in Japan. He influenced the members of his architectural office, Kenzo Tange and URTEC, causing the formation of the Metabolist Group, whose five members were: Kisho Kurokawa, Fumihiko Maki, Masato Otaka, Kyonori Kikutake, and Noboru Kawazoe. In 1960, 15 years after the end of the war and in the very middle of Japan's rapid economic growth period, Tange and URTEC proposed a Plan for Tokyo, describing an alternative direction for city planning. Kenneth Frampton explains the plan thus:

> "(The Plan for Tokyo) was surely one of the most brilliant urban proposals to be made after the end of the Second World War. Directly related to Le Corbusier's Ville Radieuse of 1934, Tange's Tokyo Bay scheme emerges, in retrospect, as the last utopian city plan of the modern era."[11]

In the sense that the Plan for Tokyo suggested a revolutionary design for the postwar industrial city, it corresponds to Le Corbusier's Radiant City, which also seeks an alternative vision freed from traditional social and architectural forms. At the same time, Frampton's phrase "last utopian city plan" seems to imply that the plan marks the end of modernity in Japan, revealing the problems that the modern project had in common with the Radiant City. The contrasts between the two projects reveal the postwar transition of Japanese architecture from modern to post-modern.

3.1.2 Architectural interpretation of science and technology

The period 1830-1930 was marked in Europe by rapid urban and industrial expansion, and by the concomitant urban poverty and depravation. Le Corbusier called this period the "First Machine Age". In contrast with this condition, he defined the "Second Machine Age", in which the beneficial potential of technology would be maximised.[12] His 1933 book The Radiant City (La Ville Radieuse) proclaimed the dawn of the new age grounded on the radical technological reorganisation of the city.[13] At the same time, Le Corbusier proclaims the age in which professional design replaces traditional community design, the age of the architect and city planner.

Le Corbusier's approach does not criticise modern technology, but accepts it positively as the main tool for constructing a new society. His argument claims that planning is no longer derived from religious and mystical meanings, but from the laws of natural science. This is the foundation of the equilibrium between man and nature in the modern age.

"Plan must rule."[14]

This phrase at the beginning of the book states the need for new regulations to be followed in the new machine age. The plan makes possible the three natural conditions of:

"sun, space and greenery,"

and the basic materials of:

"sun, sky, trees, steel, cement."[15]

This shows that the combination of nature and modern technology, as the practical interpretation of natural science, directly influences architectural design and construction. In other words, one role of modern technology is to create an ideal living environment — the city and dwellings, with technology acting as the medium between man and nature.

In contrast, Tange's Plan for Tokyo reflects the rather different socioeconomic conditions of 1950s Japan. Supported by the Korean War boom, the recovery of the Japanese economy was centred in Tokyo. Because of its rapidly increasing population, Tokyo had been sprawling outward into suburbs and had no guiding vision in particular. The city badly needed a structural shift to deal with this sprawl, and the shift was the primary stimulus for alternative planning. In the first chapter, Tange writes about conditions in Tokyo:

> "The technological revolution of the twentieth century, and particularly of its latter half, is causing drastic changes in economic structure, in social system, and in living environment..."
> "Economic progress is hastening the movement of men and capital from primary industries to secondary industries and from secondary industries to tertiary industries."
> "The inevitability of this process is explained by the difference of productivity in the various sectors of industry. People and capital both move toward industries of higher productivity."[16]

According to Tange, technology and economy are the rules for governing the city, and the objective of planning is to harmonise the individual's life with the changes in socioeconomic environments. In his planning, it seems that highly developed technology that been separated from natural science took over primary rule of the city from the sun, which had symbolised natural science by Le Corbusier in the early twentieth century. Equilibrium between man and nature was no longer seen as the primary objective. Technology, in contrast, offers equilibrium between man and economy.

> "We, for our part, recognise the necessity of Tokyo's growth, the importance of its existence, and the validity of the functions that it performs. Furthermore, we believe it possible to direct the human drive that has created the confusion of today into new channels, and for this reason we put forward a plan which we regard as both constructive and practical."[17]

Le Corbusier's interpretation of scientific rationality in his theory of urban planning is described

metaphorically in the form of the Radiant City, which represents the new era of the city both visually and narratively. A bird's-eye view of cities is developed from the micro view of leaves under a microscope, in which each housing unit can be seen as a cell. The city is the analogy of an organism — the human body, and each of the human organs corresponds to a particular function of the city.[18] Similarly, in the book The Nature of Cities, published in 1955, Ludwig Hilberseimer developed this organic relationship between housing and the city more pragmatically and rationally but less emotionally and metaphorically.[19] Tange also quotes biological structure in physical urban systems. He applies vertebrates' linear bone structures and their axisymmetric organic systems to the fundamental structure of the city. This enables the city to grow continuously across the civic axis.[20] On the micro scale, Tange claims that:

> "There are, then, two conflicting extremes — the major structures which have long life cycles and which, while restricting individual choice, determine the system of the age, and the minor objects that we use in daily living, which have a short life cycle and which permit the expression of free individual choice. The gap between the two is gradually growing. The important task facing us is that of creating an organic link between these two extremes and, by doing so, to create a new spatial order in our cities."[21]

Tange's idea was developed as Metabolism by the members of his office. As the term Metabolism suggests, the minor components, such as living space, energy, and water supplies, metabolise without changing the major structural components of buildings. This enables buildings to adapt their changing socioeconomic needs and to extend their lifespan. This idea is realised in Kurokawa's Nakagin Capsule Building (1972), which symbolises visually the two different elements: the mega-structure of the major object and capsules attached to the structure as the minor components. In the 1970s, the Metabolist trend had resulted in the development of mass construction technologies, diminishing its biological meaning in favour of exploring the technological and economic benefits.[22]

Modern technology derived from natural science also proposed new ways of living in the city. Le Corbusier's technological application enabled people to dwell with nature, which was described in the following way:

> "sun in the house,

sky through their windowpanes,
trees to look at as soon as they (the inhabitants) step outside."[23]

This faith in the power of technology is explained not only in technical languages, but also in narratives that explain visual images of the new city and urban life, so that individuals are made conscious of the dawn of a new era. His drawings in the book The Home of Man (La Maison des Hommes), showing high-rise housing exposed to the sun in the sky, surrounded by greenery on the ground, also symbolise the harmony of man, nature, and modern technology. They carry strong messages to the individual beyond mere written theory.[24] In a practical sense, the concept of "artificial sites" as a fundamental structure of the city is one of his essential concepts for creating the image of the new life in the planned city. Since natural sites on the ground are physically limited in their area, Le Corbusier stacks housing units vertically in the air, thus freeing ground-level residents from such health problems as bad sanitation and air pollution. The theory of the artificial site also relies on modern technology: on steel and concrete construction and on utilities such as water, electricity, and gas.[25] By elevating the housing on piles, the ground level is freed for public purposes or converted to open park space.

Le Corbusier's spiritual vision of the city, however, is completely missing from Japanese planning, and only the technological aspect is emphasised. The city is designed for further expansion according to the demands of rapid economic growth and increasing centralisation, which are supported by technological developments. They are the unified goals of Japanese political economy.[26] In synchronising with this trend, Tange's interpretation of "artificial sites" is seen in different ways. The plan is meant for reclaimed land in Tokyo Bay, and hence the platform itself is created artificially out of the sea without being restricted by geographic factors. On this platform the residential area is constructed vertically and separated from other areas by the sea. This makes it possible to design the organic relationships among the various types of buildings within one zone such as housing, playgrounds, recreation and sports facilities, and schools. Office districts are also built on different platforms, and are likewise based on the vertical structure of the buildings and of the infrastructure in the city.[27]

3.1.3 "Free man" and "working man" under authority

The spatial images of the new life in the Radiant City represent the practical interpretation of natural science for the assumed benefit of daily life. The city not only suggests the physical form of a harmonious relationship between man and nature achieved by means of modern technology, but also praises individual freedom. It means the promotion of new businesses, the improvement of living and working environments, and the basic delight of all in daily life.[28] The Radiant City has created the fundamental dual condition of a citizen as the "free man" pursing his own pleasure and the "working man" engaged in work. Each implies different forms of pleasure and relationships with society.

The three natural conditions of sun, space, and greenery in the city, symbolising freedom, released the individual from the usual life of heavy work, creating free man, who has various opportunities for pursuing pleasure. Outdoor sports are indispensable especially for developing a healthy body and mind under the beneficial regime of the dictational sun.[29] Moreover, his focus on sports is extended to a strategy to control the whole city functionally. Sports are at the very heart of human nature and values, and they unify:

> "a diversity of elements all of which are well worth our interest: the element of aggression first of all, then that of performance of competition:... the element of individual contribution as well as that of teamwork; a discipline freely accepted by the individual."[30]

Le Corbusier's synthesis of man and nature through the medium of outdoor sports is also applied to his stadium project (Plans pour un centre national de réjouissances populaires de 100,000 participants) in 1936-7. The plan is orientated according to the sun's movement, so that the players and the audiences can be exposed to maximum sunlight.[31] This represents the absolute power of nature metaphorically, which implies that freedom is secured under the laws of natural science.

Similarly in Tokyo, the rule of the Japanese political economy can be represented by sport facilities. As Le Corbusier symbolised the nation united under the sun, Tange's Olympic Gymnasium building is the symbol of Japanese recovery and re-admittance to the world community.[32] The world's largest tensile structure at that time demonstrated the high level of Japanese technological development.

Tange notes:

"My thought on the design went farther than the conception of a large space as a mere expanse. I wanted the space to have an exhilarating influence on the people participating in sports events within it, while promoting a sense of excitement and union with the spectators... for some time I had devoted thought to communications between architectural space and the human spirit. And these thoughts inevitably led to consideration to the topic of symbol... Symbols are crystallisation of images of historical periods in the evaluation of civilisation."[33]

For both Le Corbusier and Tange, sports symbolised the possibility of national unity under the dominating agendas.

The "working man", on the other hand, is described by Le Corbusier as follows:

"We work in order to live. We do not live in order to work."[34]

The vision of daily life that he sought is based on the idea that the greater use of machines would replace production by manual labour. Workers would spend less time working and have more free hours everyday. By using machines, individuals were supposed to be emancipated from the burden of their work, but in real society the ultimate result was slavery to machines. Consequently, work is only perceived negatively in daily life.

Le Corbusier sought to counter this negative perception of work by advocating Syndicalism. Syndicalist thought was born in the 1880s and 90s as a coalition of anarchism and socialism, and was opposed to centralised capitalism.[35] It also aspired to represent a well-ordered human world for perfect co-operative production, whose metaphor was the hierarchical pyramid of nature.[36] According to the early sociologist Georges Sorel, Syndicalism is the theorisation of the subjective irrationality or unconsciousness through which individual actions are motivated emotionally towards productive activities. This means that emotion can be defined within a part of social and political systems.[37] By applying this theory, Le Corbusier attempts to motivate individuals towards collective work in industrial production through a heightened sense of citizenship. This citizenship was supposed to contribute negative work for positive transformation in the relationship between labour and machines under industrial production. Le Corbusier demands:

"...action, participation in collective work, the realisation of which by communal effort is an undertaking that represents concrete benefit for all and the elimination of one of the greatest causes of unhappiness amongst the humbler members of society."[38]

Citizens are no longer sited passively within the production process. Citizenship developed through work makes people realise that they are taking a positive part in creating a new society. Le Corbusier in this way tries to theorise the feelings of individuals, defining their identities as productive working people within the ideal city, thus guaranteeing the city's sustainability sociopolitically and economically.[39]

Moreover, in the realisation that scientific knowledge can make the people either inactive or decisive, Sorel applied ordinary language, such as the word mythology, in order to create individual motivation beyond rationality.[40] Le Corbusier also tried to ground individual consciousness in syndicalist thinking in order to complete the theoretical aspect of the Radiant City. His theorisation is seen as the same creation of the alternative mythology — the narratives of the sun as the dictator — in order to motivate the citizens to sustain the city. Finally, the narratives of the sun converge into the grand narrative of the French Revolutionary slogan:

"Liberty!
Equality!
Fraternity!"[41]

With this slogan, Le Corbusier imagines a spiritual uplift moving the whole nation towards another revolution of individual life and society in the machine age. But this only sought the Radiant City as planning for its own sake by realising the ideal city, rather than serving primarily individual needs. The needs of individuals were not perceived through their various activities in daily life, but had been premised by Le Corbusier himself with the rationality of planning theory. Similarly, this pragmatic interpretation of mythology is advocated by Theodor W. Adorno and Max Horkheimer as follows:

"In both the pregnancy of the mystical image and the clarity of the scientific formula, the everlastingness of the factual is confirmed and mere existence pure and simple expressed as the meaning which it forbids."[42]

The project of Enlightenment had disenchanted the world, and transferred the power of knowledge from myth to reason, leading to the domination of scientific knowledge as a self-evident truth in the sense of positivism. Mythology treated as the profane by scientific knowledge has been used as a medium for interpreting technical language into narratives.[43]

There is little doubt that the postwar Japanese objective has been to assimilate to the United States and its material democracy. This identical way of motivating the whole nation as well as the political economy could be seen as one of the foundations of Tange's planning. The direction towards economic growth is self-evident, as is the summit of the hierarchical social structure. Massive construction contributed directly to postwar Japanese recovery. In order to maximise growth, the whole nation and the political economy required the efficient communication of various functions in the city. Tange writes:

> "Above all, communication is of the essence, for all the various functions are interrelated — politics with finance, finance with technology, technology with culture, culture with journalism, journalism with politics and government. Tokyo is fundamentally a huge pivotal organisation the purpose of which is to determine everything in Japan, to produce values, to create ideas, and to maintain liaison with the remainder of the world."[44]

By assimilating his idea within the synthesised political and economic direction of postwar Japan, Tange is leading the democratic power of the citizens and the government towards the technological regeneration of Tokyo. Through this postwar Japanese "enlightenment", the Japanese economic recovery was reinforced by establishing the "myth" of the American way of life. This was the history of the pursuit by both government and citizens of identical objectives aimed at creating a highly technological society.[45]

In contrast with this unique condition of postwar Japan, the identical view shared by the elites and the citizens in early twentieth century Europe is not self-evident. In order to assimilate them, Le Corbusier required strong control and leadership for leading them in a particular direction. This idea parallels Sorel's sympathy with authoritarianism. Observing the totalitarian regimes in Germany and Italy, as well as the New Deal in the United States, Le Corbusier recognises that the existence of a central authority is indispensable to promoting his plan.[46] In fact, in the first page of the book The Radiant City, we read:

"THE WORK IS DEDICATED TO AUTHORITY".[47]

Authoritarian power was essential for realising Le Crobusier's urban vision, in which the elites would direct the working classes away from the pursuit of individual desires towards the common goals of the state.[48] As Sorel had envisaged, Le Corbusier's planning combined authoritarianism organising action from above with Syndicalism encouraging spontaneous action from below. Le Corbusier is the planner as well as the authority that creates the rules and the objectives of planning, while citizens implement freedom as defined, and are encouraged to be productive by the stimulus of citizenship. Yet, his project failed by showing its limited comprehension of the citizens' needs, which was because it was planning for its own sake instead of planning whose primary concern was the citizens' needs.

3.1.4 The fallacy of the two modern projects and emergence of postmodernity

It can be said that the transition from the Radiant City through the Plan of Tokyo to the current urbanism symbolises the outcome of the modern project and its collapse, which were followed by the postmodern condition of capitalistic society. The death of modern architecture was defined by Charles Jencks as follows:

> "Modern Architecture dies in St. Louis, Missouri on July 15, 1972 at 3:32 pm. (or thereabouts) when the infamous Priuitt-Igoe scheme, or rather several of its slab blocks, were given the final coupe de grâce by dynamite..."
> "It consisted of elegant slab blocks fourteen storeys high with rational "streets in the air" (which were safe from cars, but as it turned out, not safe from crime): "sun, space and greenery", which Le Corbusier called the "three essential joys of urbanism" (instead of conventional streets, gardens and semiprivate space, which he banished)..."
> "... such simplistic ideas, taken over from philosophic doctrines of Rationalism, Behaviourism and Pragmatism, proved as irrational as the philosophies themselves... it (modern architecture) has the faults of an age trying to reinvent itself totally on rational grounds."[49]

Le Corbusier's search for a healthy and safe environment based on dictating natural science produced an irrational society marked by increasing crime. In the Radiant City, the primary values of the man-nature equilibrium are subordinated by economic and political factors defined by Le

Corbusier himself.[50] Yet, the immature political and economic coherence sought in his plan did not have the practical power to realise the man-nature equilibrium in real society, and the plan has been taken over by increasing industrial production and capital, thereby replacing the ideal plan with the reality of capitalist society. Architectural aesthetics no longer retains any autonomous value, and is absorbed into the cycle of production and consumption. Citizens' freedom is no longer acquired under the rule of the sun, but through economic power and the pursuit of individual desire.[51] Individuals are defined as consuming machines, as a part of economic systems ruled by the theory of capitalism.[52]

In this respect, the Tokyo Project seems to represent an alternative stage of urban planning, shifting its primary rules from the natural science of the Radiant City towards the economy. Yet, this attempt was also not the final goal of planning in changing the conditions of Japan's economy and exploring individual desires. Reinforced by continuous growth in the 1960s, the Japanese economy grew and Japan's GNP surpassed those of Britain and Germany in 1967.[53] The life of the individual has improved in tandem with GNP growth, which can be measured statistically by the diffusion of durable consumer goods. In the 1960s, black and white television sets, electric washing machines and fridges were called the "Three Sacred Treasures". "3C" in the 1970s meant colour television sets, home air conditioners and cars, whose diffusion was one of the indicators for the living standard in those days. A decrease in the general income disparity from 1955 to 1985 contributed to higher standards of living, especially the affordability of durable consumer goods for a large percentage of the Japanese population.[54] Symbolising this trend, 89.2% of the Japanese considered themselves "middle class" in 1967, a percentage that remained stable until 1995 (91.3%). In its support of these postwar economic developments, modern architecture failed to satisfy the exploration of individual desires and found itself in crisis. This condition is exemplified by the design of the Festival Plaza at Expo '70 in Osaka, which is another of Tange's works that followed the Plan for Tokyo and thereby represented the limitation of modern architecture. The vast space-frame roof covering the plaza was revealed as a huge void with computerised mix-media robots. Architecture had ceased to be the medium for unifying the national consensus about social systems.[55] Hajime Yatsuka, a Japanese architect criticises modern architecture:

"The breakdown of Modernism in the Osaka World's Fair seemed to mark the arrival of a new

era. But was it really something new in the progressive sense, as was then assumed, or was it only the appearance of an old problem which had hitherto been ignored? One possible reading is this: just as the technologically oriented rationality of Metabolism failed to achieve a true public realm, so had the grandiose void of Tange's symbolism and the bankruptcy of his aspiration not only to be an architect but also a leader of the people... nothing is fact was left for the architect as manipulator of the symbolic realm (architecture as language) but to attempt to 'speak into the void'."[56]

Just as Lyotard claims that postmodernity "proved as irrational as the philosophies themselves", Tange's pursuit of the "good life" by satisfying societal needs had ended in revealing the limitation of technological rationality.[57] The diversities of emerging individual desires cannot converge to form a single image of society. Architecture, as a language separated from spirit, has been producing alternative images endlessly in order to create money.

Both Le Corbusier's natural scientific synthesis of man and nature in the Radiant City and Tange's economic dynamo for postwar recovery in the Plan for Tokyo had lost their credibility to be the metanarratives in the following postmodern society.[58] This shows that in confronting the continuous changes in current society, they were not only ideologically immature, but were also rigid in their purposes for creating physical forms.

3.2 The crisis of current sustainable Japanese housing revealed

Over the last fifty years, the objectives of postwar Japan have been shifting away from the material wealth represented by mass consumption and higher standards of living, and towards the current exploitation of individual desires. The role of technology has been re-defined as satisfying these personalised desires, yet both premises bolstered economic growth. The Japanese economist Esuke Sakakibara calls it Japanese "progressivism", which consists of the two myths of technocentrism and economic growth.[59] From an ecologist's point of view, current Japanese progressivism is a major cause of increasing CO_2 emissions. In architecture, the volumes of construction and resource consumption symbolise the elevation of living standards by economic growth and technological development. Attempts to reduce CO_2 emissions, however, are not always motivated by ecological concerns. They can be seen as an alternative form of Japanese progressivism in which technocentrism

and economic growth play the main roles.

3.2.1 Scrap and build to bolster the economy

Japan consists of five major islands: Hokkaido, Honshu, Shikoku, Kyushu, and Okinawa, which are situated between 20 and 46 degrees north latitude, and 123 and 154 degrees east longitude. The difference between the highest and lowest latitudes results in a variety of climates in the country. Japan's land area is 378 thousand square kilometres, and the largest island of Honshu is 61% of the total. Japan is the same size as England, Scotland, and Wales combined. Sixty-seven percent of Japan is mountainous and forested, while cropland accounts for only 14%. Built area is less than 5%. These conditions not only create Japan's unique scenery and restrict land use, but also characterise the abundance of natural resources. The population was 125.8 million in 1996, an increase of 48 million since 1985, yet it is expected to be relatively stable until 2020.

Since the beginning of the 1990s Japan's CO_2 emissions have been unstable. At the 1992 Earth Summit in Rio de Janeiro In 1992, 155 states signed the UN Framework Convention on Climate Change, which included commitments by the developed countries to return their greenhouse gas emissions to their 1990 levels by the year 2000. At COP 3 in 1997 the parties adopted the "Kyoto Protocol", in which they agreed to reduce greenhouse gas emissions to at least 5% below their 1990 levels by the period of 2008 to 2012. In spite of these commitments, Japan's 1995 emissions were 1,220 million t CO_2, showing that its emissions had already increased 8.4% over its 1990 level of 1,125 million t. Although CO_2 emissions have been rather stable since 1995, they reached 1,231 million t in 1999, or 9.4% more than the 1990 level. This means Japan will fail to attain the target set under its 1992 commitment.[60]

In comparing the Japanese and international levels, the Worldwatch Institute shows that Japan's total CO_2 emissions rank fourth out of eight countries. Based on 1995 data, the United States was first, followed by China, Russia, Japan, Germany, India, Brazil, and Indonesia.[61] Japan is responsible for 5% of the world's emissions. In comparing emissions per capita in 1995, Japan again comes in fourth place, which is the lowest among the four developed countries: the United States is first, followed by Russia and Germany. However, the rate of emission increase in Japan between 1990 and 1995 was 8.7%, which is the highest among the four developed countries. This reveals that the attempt to reduce CO_2 emission in Japan is not working effectively.[62]

Japan's domestic emissions can be divided into the four sectors of "industry", "household", "office", and "transportation". As shown in Table 1, from 1990 to 1999 industry had the largest emissions, accounting for about 40.1% of the total 1999 emissions, and has since been decreasing gradually. By contrast, second-place "transportation" and third-place "household" have been increasing. Although industry was formerly the prime emitter of CO_2, the real concern at present is the increase in emissions from the "transportation" and "household" sectors. The Ministry of the Environment points out the major reasons for these two sectors' increases: more and more cars travelling longer distances, and higher standards of living accompanied by the increasingly widespread use of air conditioning and electric appliances. They are also forecast to increase steadily in the future.[63]

million tC
(%)

	Industry	Transportation	Household	Office	Totals
1990	138	59	38	34	320
	43.1	18.3	11.9	10.5	100
1991	137	61	39	36	326
	42	18.7	11.8	10.9	100
1992	134	63	41	37	330
	40.5	18.9	12.3	11.1	100
1993	132	63	41	35	324
	40.7	19.4	12.6	10.8	100
1994	137	66	43	39	343
	39.9	19.2	12.5	11.3	100
1999	140	73	44	41	350
	40.1	20.9	12.6	11.6	100.0

Table 1: Transition of CO_2 emissions in Japan (by category)

Source: The Ministry of the Environment, Donaru Chikyu Dosuru 21 Seiki [The Future of the Earth, the Future of the Twenty-first Century] (1996), pp.50-3, Kankyo Hakusyo [Quality of the Environment in Japan] (2000), p. 150.

In the same way that housing is divided into existence and design in Chapter 1, so CO_2 emissions related to architecture are divided into two parts in a practical sense. The construction that corresponds to design in architecture consists of two categories here: "industry" and "transportation". "Industry" means material production and construction itself, and "transportation" corresponds to transport of the material. The use that corresponds to its existence consists of "household" and "office". Both contribute to CO_2 emissions through the lifespan of the house.

As Figure 1 shows, in 1990 more than one-third (36%) of Japan's total CO_2 emissions were related

to architecture. According to building type, CO_2 emissions from housing are responsible for 17.7% of Japan's total, and for about half of the total emissions from architecture. This shows that more than one quarter of Japan's total emissions are directly related to housing. When total emissions from architecture are divided into construction and use, two-thirds of the emissions are from use, and housing use (12.5%) is slightly larger than non-housing use, such as that of office and commercial buildings (11.4%). These preponderant emissions from the use of both housing and non-housing seem to be the primary reduction target.[64]

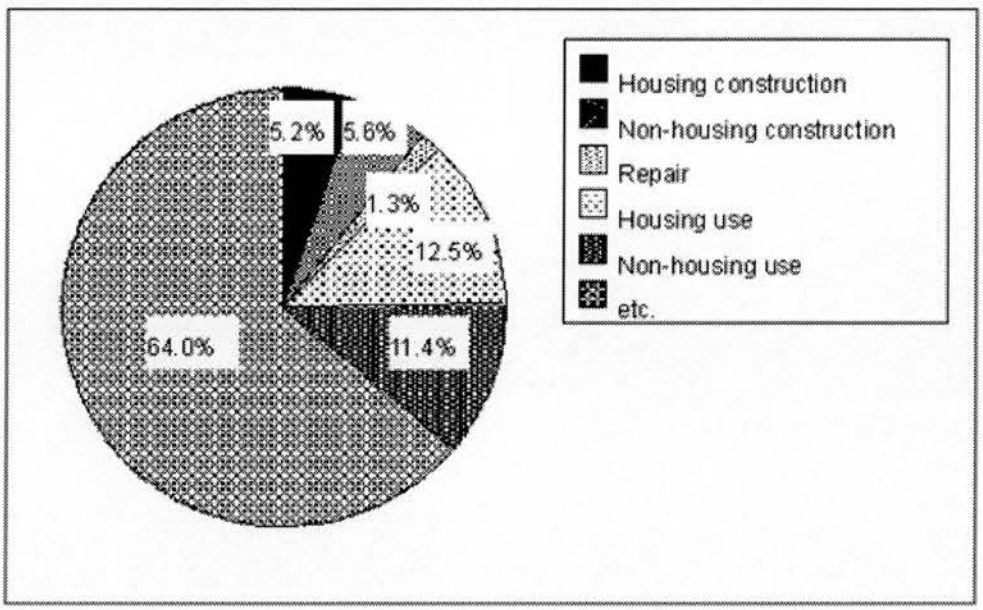


Figure 1: CO_2 emissions related to architecture in 1990

Source: The Architectural Institute of Japan, Lifecycle CO_2 de Tatemono wo Hakaru: Tatatemo no Kankyo Fuka Hyoka no Tebiki [Measuring Building by Lifecycle CO_2] (1997), p. 3.

Japan's 1993 housing stock was 45.9 million, an increase of 9.2% since 1988. Although the number of flats has been increasing rapidly, more than half of all housing units are still detached. The number of housing units built annually peaked at 1.6 million (including flats) in 1996, and decreased to around 1.2 million towards the end of the 1990s owing to the economic recession. In the 1990s housing on the market was between 8 and 10% of annual construction.[65] In the United States by contrast, the amount in 1996 was 257% of annual construction. Also, the percentage of total stock on the market was less than 0.5% in Japan, far less than nearly 4% in the United States and 5% in Britain in the same year. This is reflected in the shorter housing lifespan: 30 years in Japan, compared to 96

years in the United States and 141 years in Britain.[66] This short cycle from construction to demolition of Japanese housing is called "scrap and build". Based on this system, the strong relationship between economic bolstering and housing construction has developed a unique market structure. Japanese housing consequently produces large CO_2 emissions from housing construction.

3.2.2 Increasing imported wood and wooden housing

Traditionally, Japanese detached housing is built from wood. Because of the abundant natural resources from Japan's expansive wooded area, wood has been used not only as the main material for buildings, but also for fuel and other purposes. As a result of the current increased construction of flats, which are usually built from non-wood materials such as steel and concrete, the share of wooden housing stock decreased from 60% in the 1970s to 45% in 1995. Yet, wooden housing construction still accounts for about 80% of detached and semi-detached housing, coming to between 500 and 600 thousand units. This means that wooden detached housing strongly characterises the Japanese housing market.[67]

The large amount of wooden housing construction is accompanies with resource consumption. In spite of Japan's abundance of natural resources, Japan is far from being self-sufficient in the wood for housing construction. In 1999 the self-sufficiency rate was only 19.2%.[68] Currently, sawmill demand for wooden housing constitutes quite a high percentage of wood demand, which is supported by imports. As shown in Figure 2, 1994 figures show that the percentage of milling is nearly half of the whole demand in Japan, and domestically produced wood satisfies only 34% of total milling demand. Eighty percent of milling is building construction and 72% is housing construction: wooden housing accounts for 62% of total milling demand. This shows that wooden housing dominates milling demand in Japan, accounting for nearly 30% of the whole.[69] The high percentage of imported wood in Japan has a global ecological impact. According to Worldwatch, current world log production has increased three-fold since 1950. More than half of that production is consumed in European countries, the United States, and Japan, which have less than 20% of the world population. Instead of being a wood producer, Japan is one of the major consuming countries. In fact, it is the highest importer in the world, accounting for 37% of the total global wood trade.[70] Japan is the largest importer of wood from the United States, and second-largest for Canadian wood.[71] In 1999, those countries exported 32 million cubic metres of sawing wood to Japan, which was 33.1% of Japan's total demand and 41.0%

of total wood imports.[72] This shows strong relationships between the importing and exporting countries. But this North American production is not ecologically sustainable. Worldwatch reports that Canadian forest area has been decreasing because of excessive logging that also influences regional ecological systems. Within thirty years logging has exceeded the sustainable level by three-fold. This has damaged two thirds of the ecology of the total forest area, seriously affecting the survival and propagation of salmon in the rivers.[73] Wood importing by Japan is no longer an issue in Canada, but it is affecting the ecology of the exporting country. In this respect, Japanese responsibility for global ecological impacts cannot be ignored.

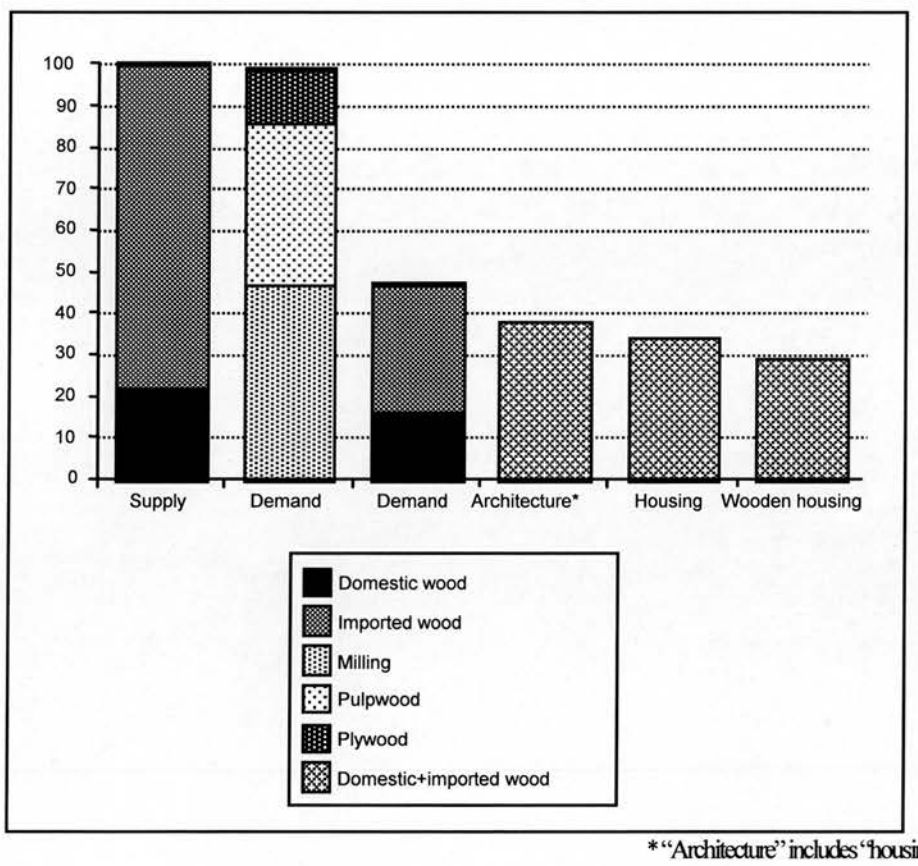
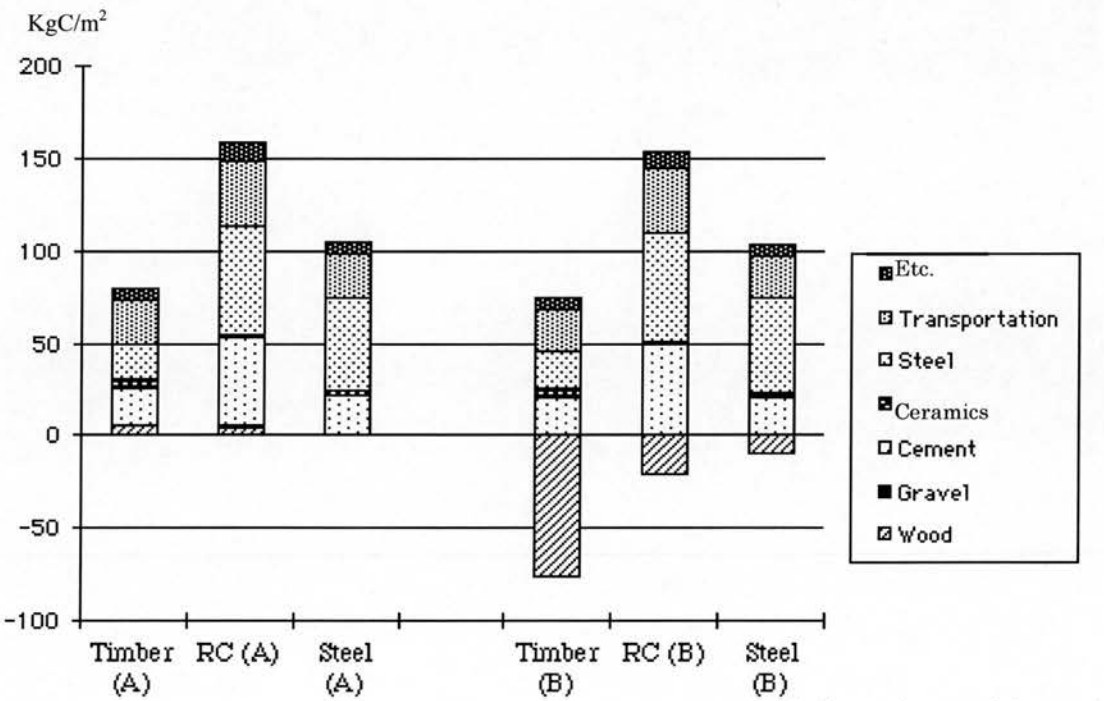


Figure 2: The structure of wood demand in Japan (1993 basis)

Source: Norin Tokei Kyokai, Shinrin Hakusyo [Forestry White Paper] (1995, p. 8.

In spite of Japan's unsustainable wood supply, wooden housing itself emits less CO_2 than other types of structures, which supports the argument that wooden construction is "ecologically friendly" in a general sense. Kanji Sakai, an architectural engineer, calculates CO_2 emission per square metre for different kinds of buildings.[74] As Figure 3 shows, Sakai calculates that carbon emissions from constructing wooden buildings are half those of reinforced concrete buildings and less than three quarters those of steel structures. This indicates that wooden building construction could reduce carbon emissions more than other structural techniques. Moreover, because of the carbon stored in wood, construction using wood can be considered a carbon sink rather than an emission source. Wooden buildings hold 2 kg/m^2 of carbon, which is the total balance of the stock and emissions (See: Figure 3 B). On the other hand, steel and reinforced concrete structures, both of which use wood only in supplementary roles, show little difference between their carbon emissions whether the carbon in wood is factored in or not.



A: excluding carbon stock in wood
B: including carbon stock in wood

Figure 3: Carbon emissions from building construction

Source: Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings] (Tokyo: Kuki-Chowa Eisei-Kogakkai-Shinsyo, 1995), p. 135.

In the global context, current Japanese wooden detached housing can be summarised by two points. As a positive aspect, wooden structures emit less CO_2, contributing to the reduction of CO_2 emissions from housing construction. Yet, this advantage is not always optimised by the Japanese housing market. The large amount of wood consumption is caused by scrap-and-build housing, together with the lower rate of used housing on the market. This not only accelerates CO_2 emissions from housing construction, but also has global ecological impacts by increasing wood imports. This relationship between the positive and the negative aspects of wooden housing characterises the current fundamental condition of the Japanese wooden housing market.

3.2.3 Technocentric approach: High insulation and airtightness

In dealing with the global environmental crisis, the political response to climate change started with the 1990 "Action Program to Arrest Global Warming", which set forth the following three objectives:

1. CO_2 emissions per capita: stabilisation at the 1990 level after 2000.
2. Total CO_2 emissions: stabilisation at the 1990 level after 2000.
3. CO_2 sequestration: No quantitative target.[75]

After the 1992 Earth Summit, Japan's Ministry of the Environment issued the "Basic Environment Plan" and enacted the "Basic Environment Law" in 1994. The latter replaced the preexisting "Basic Law for Environmental Pollution Control". The plan and law focus on the following four points:

1. Closed material cycle
2. Symbiosis
3. Participation
4. International efforts

These form as the long-term foundation of Japanese environmental policy. Specifically with respect to architecture, there have been two different initiatives to reduce CO_2 emissions from housing construction: one by the Ministry of Construction and the other by the Architectural Institute of Japan (AIJ). The Ministry deals with policymaking for controlling housing standards in terms of energy efficiency, while the AIJ analyses fundamental data such as those for the assessment of CO_2 emissions

from housing. Although each has a different stance, they both advocate energy conservation and the diffusion of technology called "high insulation and airtightness". Since the technology contributes to reducing CO_2 emissions from use rather than construction, their main concern is, rather than construction emissions, the use of housing over its lifetime as the largest category of CO_2 emissions in architecture.

The idea of high insulation and airtightness is a response to the disadvantages of traditional wooden housing. One of the characteristics of traditional housing is its openness, which provides ventilation for the hot and humid Japanese summer. On the other hand, this is a serious disadvantage for energy efficiency in winter. As shown by the term "high insulation and airtightness", the technology consists of two technologies. Increasing insulation stabilises the indoor environment by isolating it from the influence of the outdoor environment, such as summer heat and winter cold. Airtightness, which depends on high insulation, shuts air in and out of the house. The method is based on using insulation materials and airtight plastic sheets so that the indoor environment is separated from the outdoor environment.[76] This combination is indispensable for increasing energy efficiency, and has been adapted to reduce CO_2 emissions in housing use.

To address the increasing consciousness toward energy conservation, the Ministry of Construction established the "Law Concerning the Rational Use of Energy" (which is simply called the "Energy Conservation Law"). Currently, this is one of the important criteria related to housing energy efficiency. According to government policy, Japan is divided into six numbered areas, shown in Figure 4. Apart from one exceptional area, a heat loss coefficient is set for each area according to climatic difference. Standards under the new regulation issued in 1992 have higher heat loss coefficients for Areas I to IV than the old standards, and higher energy efficiency is required for greater reduction of CO_2 emissions from housing use in each area. Neither old nor new standards impose any legal obligation on the individuals who plan to build their own homes. Yet, in order to apply for government housing loans they must comply with the old standards according to the area where a home is to be built. Moreover, compliance with the new standards is required for an additional loan. Sixty-five percent of owner-occupied homes in 1994 and 55% in 1995 were built with government housing loans, which shows that these standards have had an indirect influence on individual decision-making through personal finance.[77]

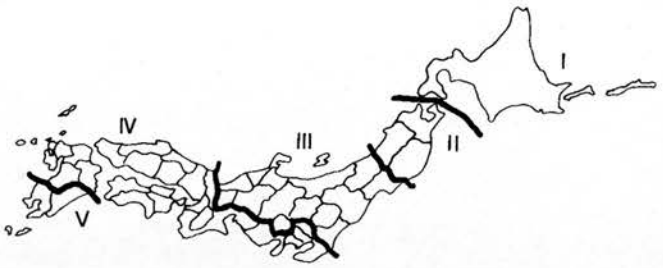


Figure 4: Law Concerning the Rational Use of Energy

	I	II	III	IV	V
Heat loss coefficients (the old standard)	2.8	3.6	4.4	4.8	6.8
Heat loss coefficients (the new standard)	1.5	2.3	2.7	3.4	3.7
Energy efficiency (the old standard)	100	100	100	100	100
Energy efficiency (the new standard)	58	78	69	80	60

Heat loss coefficient: $kcal/m^2 \cdot h \cdot C$

"Energy efficiency" means energy consumption under the new standards when that under the old standard in each area is set to 100.

Table 2: Heat loss coefficients in the five areas defined in the Law Concerning the Rational Use of Energy

Meanwhile, AIJ research on the wider relationship between architecture and global environmental issues was summarised in a 1995 report comprising nine categories: "Lifestyle", "Resource Usage", "Urban Environment", "Urban Climate Modelling", "LifeCycle CO_2", "Urban Planning", "Rural Planning", "Harmonious Coexistent Architecture", and "Eco-city". [78] This multidimensional comprehension of global environmental issues is significant in the sense that the report shows the strong relationship among ecological sustainability, human activities, and architecture, and it also affirms the responsibility of architects for the issues.

The "LifeCycle CO_2" ($LCCO_2$) category is a tool for assessing CO_2 emissions through the whole building lifespan from construction through operation to demolition. Originally it was developed as a different tool called "LifeCycle Cost" for cost analysis, in order to design for heightened cost

effectiveness, not only in construction but also through a building's entire lifespan. $LCCO_2$ is the extended version of LCC, and translates cost analysis into CO_2 emissions analysis. According to the report, the LifeCycle CO_2 calculation through the entire housing lifespan is based on the same five-area distinction as the Energy Conservation Law. In comparing the old and new standards of energy conservation for wooden detached housing, carbon emissions from construction to use in each of the five areas is shown in Figure 5. (A) compares carbon emissions under the new and old standards in each of the six areas from construction and use (space heating and cooling). In construction, the largest difference between the old and new standards among the five areas is in Area I, where CO_2 emissions under the new standard are nearly 2 kgC/m^2 more than old-standard emissions because of increasing material use. In Area IV, to which Tokyo belongs, increased CO_2 emissions through construction are only 1 kgC/m^2, half of those in Area I. However, through housing use the new standard can annually reduce CO_2 emissions by 6 kgC/m^2 in Area I and 1 kgC/m^2 even in Area IV from the old standard. [79] Also, (B) (above) shows the number of years it takes the new housing standards to recoup the construction cost increase compared to the old standards in terms of both LCC and $LCCO_2$ in each area. The construction cost increase can be recouped in two years in Area I and four years in Area IV, and the increased CO_2 emissions can be offset in only one year in every area. It proves that the new technology can contribute to reducing both CO_2 emissions and housing costs through construction and use. Moreover, (B) (below) shows the difference in the increase of CO_2 emissions per house between the two standards in Area IV. The CO_2 emission difference between the two standards increases with the number of years used, so the longer a house lasts, the more effective the new standard is in terms of reducing CO_2 emissions.[80]

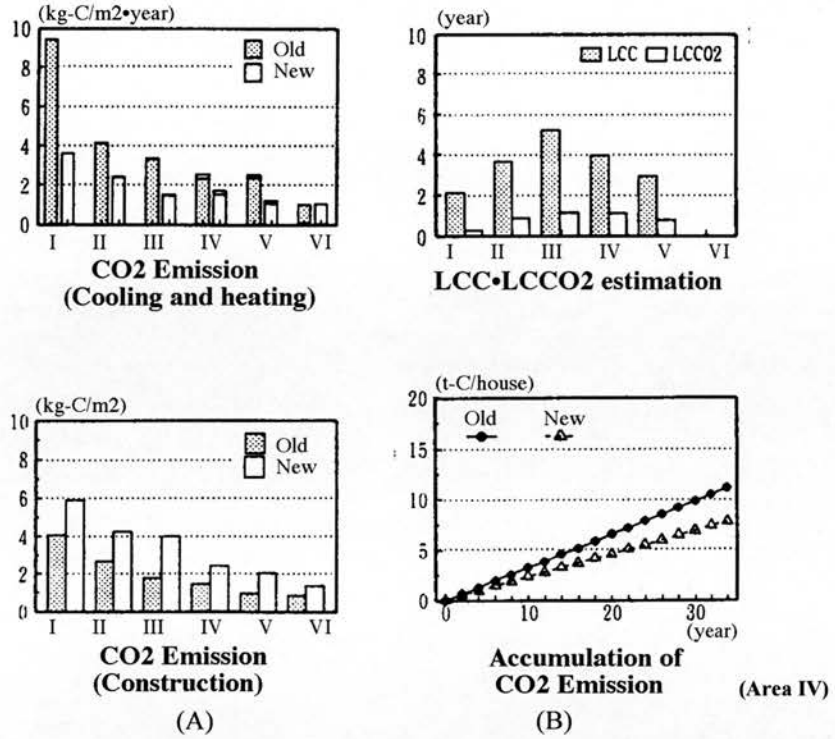


Figure 5: Comparative analysis of the old and new standards for energy conservation in wooden detached housing

Source: The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment] (1995), p. 106.

The two technocentric approaches by the Ministry of Construction and AIJ for reducing wooden housing CO_2 emissions are the leading Japanese strategies for this purpose. Both are based on the concept of the region, which is defined by the relationship between climatic data and housing technology efficiency, which is measured objectively in terms heat loss coefficients. However, high insulation and airtightness are not the ultimate solution for Japanese housing: it is only the first step towards increasing the adoption of eco-compatible housing promoted by the Ministry of Construction. The second step is passive solar design by accumulating and storing solar energy, followed by the third step of ecological equilibrium, which is beyond simple energy conservation.[81] In this way, the Japanese technocentric approach is making faster progress towards achieving ecological housing for the future.

The fundamental stance of this technocentrist attitude is in high-volume housing construction. It seems to have inherited the postwar Japanese government policy of progressivism and sustaining economic activity, thus actively seeking a compromise with ecological sustainability. This has brought two issues to the fore: The scrap and build system, which accelerates material consumption in

connection with wooden housing, and wood imports, which damage ecological systems on a global scale. In spite of governmental efforts to reduce CO_2 emissions in Japan, the increase in emissions shows that the approaches are not working efficiently to achieve the "Kyoto Protocol" targets in the period of 2008 to 2012.

Yet, the attempts to reduce architecture-related CO_2 emissions have not ended. In July 2000, AIJ and the other four architectural organisations released the "Architectural Charter for a Global Environment", which consists of the following five points:

1. Longevity

   Architecture shall be planned, built, used, and maintained as long-term social property, with a multiple-generation lifetime.
2. Symbiosis

   Architecture shall constitute an element of a sound social environment which is in harmony with the natural environment and which co-exists with the diversity of life on Earth.
3. Energy Conservation

   Architecture shall minimise consumption of energy throughout its lifetime, and maximise the use of natural and unexploited energy resources.
4. Resource Conservation and Cyclicality

   Architecture shall incorporate reusable and recyclable resources and materials having the minimum environmental burden, and minimise consumption of natural resources throughout its lifetime.
5. Succession

   Architecture shall be created as a cultural component, respecting the local history and identity, relating to its "genius loci", and lasting into future generations as a good incubator.[82]

It can be said that this charter reflects the current condition of architectural design and its relationship with the global environmental issues mentioned above. For example, in order to reduce scrap and build, the charter proclaims importance of building longevity, which is a significant milestone on the long journey towards architectural sustainability.

However, it does not provide any reasonable solutions towards extending architectural lifespan, which is determined largely on the basis of clients' own decisions. Their decisions, in turn, are heavily influenced by information that is purveyed through the media and that encourages consumption to bolster the economy. Solutions for current global environmental problems cannot be

found in comprehending the material and energy flows through a building's lifetime. The sociopolitical system and its control of the individual sense of value seem deeply implicated in the issues of scrap and build and imported wood. In order to analyse this mechanism, the sociopolitical values of housing should be analysed in contrast with the ecologists' view, which reveals the problems implied in the two issues of scrap and build and wood imports.

---

1 See: Introduction.

2 See: Chapter 1.

3 William H. Coaldrake, Architecture and Authority in Japan (London: Routledge, 1996), p. 208.

4 J. Victor Koschmann, Revaluation and Subjectivity in Postwar Japan (Chicago: The University of Chicago Press, 1996), p. 174. Koschmann writes on Maruyama Tomoyoshi's 1946 essay "Theory and Psychology of Ultranationalism".

5 James E. Vestal, Planning for Change: Industrial Policy and Japanese Economic Development, 1945-1990 (Oxford: Clarendon Press, 1993), p. 14. Vestal claims that:

> "By the end of the war, Japan had lost one-quarter of its national wealth through damage to factories, equipment, commercial buildings, and houses. Individual production was one-sixth of its 1934-6 average, 13.1 million individuals had lost their jobs in the military, in overseas colonies, and in military-related production."

6 See: Takafusa Nakamura, The Postwar Japanese Economy: Its Development and Structure, 1937-1994 (Tokyo: University of Tokyo Press, 1995).

7 See: The Economic Planning Agency, Keizai Hakusyo [Economic White Paper] (1956).

8 J. Victor Koschmann, Revaluation and Subjectivity in Postwar Japan, p. 174.

9 See: J. Victor Koschmann, Revaluation and Subjectivity in Postwar Japan, p. 232. Koschmann calls the postwar period an "Enlightenment".

10 See: Eisuke Sakakibara, Shinpo Syugi karano Ketsubetsu: Nippon Ishituron no Tsumi [Farewell to Progressivism] (Tokyo: Yomiuri Shinbunsya, 1996).

11 Kenneth Frampton, "The Rise and Fall of Mega-Architecture: Arata Isozaki and the Crisis of Metabolism 1952-66", in GA Architect 6: Arata Isozaki, vol. 1 1959-1978 (Tokyo: A. D. A. Edita, 1991), pp. 8-9.

12 Robert Fishman, Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Crobusier (New York: Basic Books, 1977), p. 235.

13 Le Corbusier, The Radiant City, trans. Pamela Knight, Eleanor Levieux and Derek Coltman (London: Farber and Farber Limited, 1967).

14 Le Corbusier, The Radiant City, p. 8.

15 Le Corbusier, The Radiant City, p. 86.

16 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann (London: Pall Mall Press, 1970), p. 114.

17 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann, p. 134.

18 Le Corbusier, The Radiant City, pp. 143-6. The cell is based on 14 square metres per occupant, and the size of a housing unit is decided by the number of its occupants, such as 2 x 14 m^2 for two, and 3 x 14 m^2 for three. The plan can be easily accommodated by modern steel and concrete technology with "free planning", which was one of the Le Corbusier's own "five points of architecture".
Also, Charles Jencks, Le Corbusier and the Tragic View of Architecture (London: Allen Lane, 1973), p. 123. Charles A. Jencks says:

> "the business centre as the head, housing and institutes as the spine, factories, warehouses and heavy industry as the belly."

19 See: L. Hiberseimer, The Nature of Cities (London: Paul Theobald, 1955). The concept of the unit is the essential foundation for family and community, planned according to their density and to the orientation that determines the hours of sun penetration in the residential zone. The zoning of

residential and industrial areas are decided according to the environment and transportation efficiency in the city.

20 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann, p. 118.

21 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann, p. 130.

22 See: Michael Franklin Ross, Beyond Metabolism: The New Japanese Architecture (New York: McGraw-Hill Book Company, 1978), pp. 55-70. The influences of metabolism can be seen in MCS (Mitsui Checker System) by the Mitsui Construction Company and TOS (Taisei Overseas System) by Kurokawa himself in league with the Taisei Construction Company. This trend was separately explored by Yoshichika Uchida's "open system", which enabled architecture to systematically extend factory-made production. This is based on the traditional Japanese module system, as well as Le Corbusier's use of prefabricated materials, in the box-unit system called "Sekisui Haim" by the Sekisui Chemical Co.

23 Le Corbusier, The Radiant City, p. 86.

24 See: Le Crobusier and François De Pierrefeu, The Home of Man, trans. Clieve Entwistle and Gordon Holt (London: The Architectural Press, 1948).

25 Le Corbusier, The Radiant City, pp. 55-6.

26 J. Victor Koschmann, Revaluation and Subjectivity in Postwar Japan, pp. 231-48. For example the writer Masato Ara describes the model of subjectivity as "weighted towards individuality and the primacy of artistic expression over more direct forms of social engagement". Also, Hisao Otsuka describes postwar Japanese subjectivity in the partially dehistoricised form of a juxtaposition between the subject and the social whole (totality), which is ultimately internalised as self-discipline for the totality. These show that postwar Japanese subjectivity was assimilated with economic development.

27 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann, pp. 24-7.

Also, see: GA Architect 6: Arata Isozaki, vol. 1 1959-1978, pp. 24-7. Arata Isozaki, a Japanese architect who designed office districts, later developed the so-called "joint core system". A number of cores are jointed in the air to vertically create living space and its infrastructure. This idea is shown in the series of sketches "City in the Sky" (1960-3) and "Sinjuku Project" (1960-1), in which the mega-structure is dramatically developed.

28 Le Corbusier, The Radiant City, pp. 11-4.

29 Michel Foucault, Power/Knowledge, Selected Interviews and Other Writings 1972-1977, trans. by Colin Gordon, Leo Marshall, John Mepham and Kate Soper (New York: Harvester Wheatsheaf, 1980), p. 58. As Michel Foucault claims, it was necessary for power to invest the body in order to make a capitalist society function. He claims that:

> "What mode of investment of the body is necessary and adequate for the functioning of a capitalist society like ours? From the eighteen century to the early twentieth century, I think it was believed that the investment of the body by power has to be heavy, ponderous, meticulous, and constant. Hence, those formidable disciplinary régimes in schools, hospitals, barracks, factories, cities, lodgings, families".

30 Le Corbusier, The Radiant City, p. 66.

31 Max Bill (ed.), Le Corbusier & P. Jeanneret: Æuvre complète, 1934-1938 (Zurich: Les Editions d'Architecture, 1964), pp. 90-7.

32 William H. Coaldrake, Architecture and Authority in Japan (London: Routledge, 1996), pp. 256-7. Coaldrake quotes Daigoro Yasukawa (president of the Olympics Organising Committee) that the Tokyo Olympics "will not only be a display of sportsmanship by the world's athletes, but will also highlight the continuing efforts of the Japanese people as a worthy member of the world family of nations."

33 William H. Coaldrake, Architecture and Authority in Japan, p. 259. Quoted from Kenzo Tange, "Recollections: Architect Kenzo Tange", in The Japan Architect (No. 341, September, 1985), p. 6.

34 Le Corbusier, The Radiant City, p. 106.

35 William J. R. Curtis, Le Corbusier: Ideas and Forms (Oxford: Phaidon, 1986), pp. 119-20.

36 Robert Fishman, Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Crobusier, p. 229.

37 See: Irving Louis Horowitz, Radicalism and the Revolt against Reason: the Social Theories of Georges Sorel (London: Routledge, 1961).
38 Le Corbusier, The Radiant City, p. 86.
39 See: Chapter 2. It should be obvious that this concept of "citizenship" corresponds to the "community development" in modernisation theory.
40 Irving Louis Horowitz, Radicalism and the Revolt against Reason: the Social Theories of Georges Sorel, pp. 127-44.
41 Le Corbusier, The Radiant City, p. 11.
42 Theodor W. Adorno and Max Horkheimer, Dialectic of Enlightenment, trans. by John Cumming (London: Verso, 1979), p. 27.
43 See: Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, trans. by Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984).
44 Kenzo Tange, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann, pp. 116-7.
45 See: Eisuke Sakakibara, Shinpo Syugi karano Ketsubetsu: Nippon Ishituron no Tsumi [Farewell to Progressivism].

46 Robert Fishman, Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Crobusier, p. 236.
47 Le Corbusier, The Radiant City. Also, see: Le Corbusier, Destin de Paris (Paris: Fenand Sorlot, 1941). In France under German rule, he tried to reconstruct the country by attracting the politicians.
48 Irving Louis Horowitz, Radicalism and the Revolt against Reason: the Social Theories of Georges Sorel, pp. 169-70.
49 Charles A. Jencks, The Language of Post-modern Architecture: Fourth Revised Enlarged Edition (London: Academy Editions, 1984), pp. 9-10.
50 Constantinos A. Doxiadis, Between Dystopia and Utopia (London: Faber and Faber, 1966), pp. 23-48.
51 David Harvey, The Condition of Postmodernity: An Enquiry into the Origin of Cultural Change (Cambridge, MA: Blackwell, 1990), p. 35.
52 On the consumer society, see: Jean Baudrillard, The Consumer Society: Myth and Structure (London: Sage Publications, 1998).
53 The Economic Planning Agency, Kokumin Seikatsu Hakusyo [Annual White Paper on Life in Japan] (1995), pp. 8-10.

54 Kenji Kosaka (ed.), Social Stratification in Contemporary Japan (London: Kegan Paul International, 1994), pp. 35-6. Until 1965, 30% of the total national income had been received by the top 10% of the population, but that share decreased to 22.7% in 1985. On the other hand, the bottom 25% has been rather stable since 1955, at around 10% of the total income. The decrease in the income share of the top 10% seems to equal the increase in the incomes of citizens between the top 10% and the bottom 25%.
55 See: Syuji Funo, Sengo Kenchiku no Syuen: Seikimatsu Kenchikuron Note [The End of Postwar Architecture] (Tokyo: Renga Syobo Shinsya, 1995), pp. 40-5.

56 Hajime Yatsuka, "Architecture in the Urban Desert: A Critical Introduction to Japanese Architecture after Metabolism", in Oppositions 23 (Winter, 1981).
57 Charles A. Jencks, The Language of Post-modern Architecture: Fourth Revised Enlarged Edition, p. 10.
58 Jean-François Lyotard, The Postmodern Condition: A Report on Knowledge, xxxiv. Lyotard defines postmodern as "incredulity toward metanarratives".
59 See: Eisuke Sakakibara, Shinpo Syugi karano Ketsubetsu: Nippon Ishituron no Tsumi [Farewell to Progressivism].

60 The Ministry of the Environment, Kankyo Hakusyo [Quality of the Environment in Japan] (2000), p. 150.

61 Lester R. Brown, Chikyu Hakusyo 1998-99 [State of the World] (Tokyo: Diamond Sya, 1998), pp. 11-21. According to the Worldwatch Institute, these eight countries (four developed and four developing countries) are the so-called "E8" and have 56% of world population and 59% of

world economic production, both of which are significant factors in CO2 emissions. In the order of CO_2 emissions among the eight countries, Germany and India both rank fourth, while Brazil and Indonesia both come in at seventh.

62 Lester R. Brown, Chikyu Hakusyo 1998-99 [State of the World], pp. 11-21.

63 The Ministry of Environment, Donaru Chikyu Dosuru 21 Seiki [The Future of the Earth, the Future of the Twenty-first Century] (1996), pp. 50-3, Kankyo Hakusyo [Quality of the Environment in Japan], p. 150.

64 The Architectural Institute of Japan, Lifecycle CO_2 de Tatemono wo Hakaru: Tatatemo no Kankyo Fuka Hyoka no Tebiki [Measuring Building by Lifecycle CO_2] (1997), p. 3.

65 The Ministry of Construction, Kensetsu Hakusyo [Construction White Paper] (1996), p. 236, (2000), pp. 292-3. The numbers of annual dwelling construction and circulation are as follows:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Number of housing units built annually (×1,000) (A)	1,665	1,343	1,420	1,510	1,561	1,485	1,630	1,341	1,180	1,226
Annual housing circulation (×1,000) (B)	101	117	137	125	-	-	-	-	-	-
B/A(%)	6%	9%	10%	8%	-	-	-	-	-	-

66 Tokyo To, Tokyo Jutaku Hakusyo [Tokyo Dwelling White Paper] (1998), p. 15.

67 Zaidanhojin Jutaku Sangyo Joho Service, Jutaku Sangyo Handbook [Housing Industry Handbook] (1997), p. 10.

68 The Forestry Agency, Ringyo Hakusyo [Forestry White Paper] (2000), p. 204.

69 Norin Tokei Kyokai, Shinrin Hakusyo [Forestry White Paper] (1995), p. 8.

70 Lester R. Brown, Chikyu Hakusyo 1998-99 [State of the World] (Tokyo: Diamond Sya, 1998), pp. 38-72.

71 See: Yoshinao Murashima (ed.), America Ringyo to Kankyo Mondai [Forestry in the United States and the Environmental Issues] (Tokyo: Nippon Keizai Hyoronsya, 1998).

72 The Forestry Agency, Ringyo Hakusyo [Forestry White Paper], p. 206.

73 Lester R. Brown, Chikyu Hakusyo 1998-99 [State of the World], pp. 38-72.

74 Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings] (Tokyo: Kuki-Chowa Eisei-Kogakkai-Shinsyo, 1995), pp. 134-5.

75 The Ministry of Environment, Donaru Chikyu Dosuru 21 Seiki [The Future of the Earth, the Future of the Twenty-first Century], pp. 55-6.

76 Shin Mokuzo Jutaku Gijutsu Kenkyu Kyogikai, Shin Zairai Koho Manual [New Standard Japanese Construction Method Manual] (1995), p. 6-8.

77 Zaidanhojin Jutaku Sangyo Joho Service, Jutaku Sangyo Handbook [Housing Industry Handbook], p. 41.

78 The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment] (1995). Also, see: The Architectural Institute of Japan, Kenchiku ga Chikyu Kankyo ni Ataeru Eikyo [Architectural Influence on the Global Environment], (1992).

79 The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment], pp. 89-108.

80 The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A

Prescription for the Earth, Local Environments, and the Global Environment], pp. 89-108.

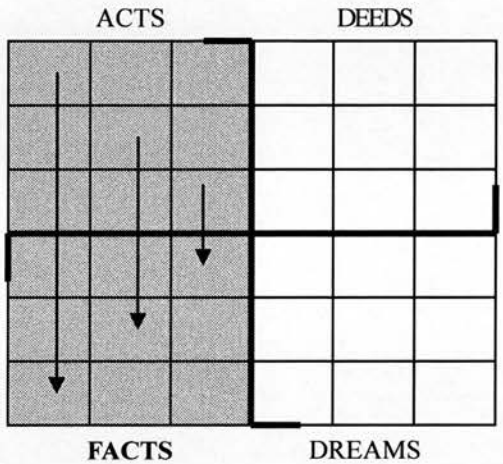
81 Yuichiro Kodama, "Tokusyu 'Mokuzo Jutaku to Kankyo Kyosei" [Wooden Housing and Environmental Symbiosis], in Jutaku to Mokuzai (April 1996), pp. 22-5.

82 Architectural Institute of Japan, Japan Federation of Architects & Building Engineers Associations, Japan Association of Architectural Firms, Japan Institute of Architects and Building Contractors' Society, Architectural Charter for a Global Environment (2000).

CHAPTER 4:

From "Acts" to "Facts":

The Two Value Claims: Economy and Ecology



Chapter 3 discussed the current conditions of housing and CO_2 emissions, categorised as "Acts" in Geddesian terms. This chapter builds on that discussion by focusing on the individual's perceptions of these conditions. To begin with, the two previously identified issues of scrap and build and imported wood are examined by contrasting the two different sustainabilities: economic/sociopolitical sustainabilities from the economist's point of view and ecological sustainability from the ecologist's point of view. The existence of global environmental issues notwithstanding, ecologists' arguments cannot solve the relevant problems by the simple application of their alternative principles. This is because the problems are not only governed by current socioeconomic conditions, but also rooted in the individual's distorted perceptions of nature, lifestyle, and global environmental issues. In order to curb the current trend of increasing CO_2 emissions from housing, these perceptions should be targeted for modification. This could be an alternative search for spiritual sustainability by individuals who desire housing.

In accordance with the "Facts" category in Geddes' Notation of Life, the discussion will shift towards the anthropological aspect of global environmental issues as related to Japanese wooden housing. Such an understanding is fundamental to redirecting individual awareness to their

surrounding environment. This analysis, however, is no longer made on the whole country of Japan in general. Instead, it must focus on the relationship between individual ways of thinking and the geographic factors that have continuously influenced them. For that purpose this chapter exemplifies the two regions of Tokyo and Hokkaido, and contrasts the unique developments of individual awareness and the sense of value in each region.

4.1 Two conflicting viewpoints: economists and ecologists

Ecologists have their own criteria, differing radically from those of economists, for assessing the ecological impacts of building construction and use. Current Japanese policies, which encourage scrap and build and extensive timber imports, are at variance with ecologists' concerns for global ecological balance. Contrasting the economists' and ecologists' standpoints in relation to government policies will reveal the communication gap between these two positions.

4.1.1 Scrap and build

It could be said that postwar Japanese housing policy is conceived from the two progressivist myths of economic growth through continuous construction, and technocentrism whose object is higher standards of living as the main criterion for housing. Scrap and build, a constant feature of housing design throughout the postwar period, is promoted by government policy. After the war, the government promoted massive housing construction because of the housing shortage caused by wartime damage. At that time, quantity was a greater concern than quality, and the poor quality of housing built under that policy was one of the government's primary motivations in promoting scrap-and-build planning in order to improve housing and living standards. Five-year housing programs were formulated by the Ministry of Construction, setting official targets for housing standards and the annual number of homes built. In spite of this policy, the average Japanese house still offered much less space and quality than those of Western countries in 1979, and Japanese homes were called "rabbit hutches" for their small size. The seventh five-year housing program from 1996 to 2000 had a construction target of 7.3 million homes in five years and 1.46 million annually, the same targets as in the sixth program from 1990 to 1996.[1] Scrap and build is still promoted by the ministry as the primary way to achieve higher standards, and the role of heavy insulation and airtightness can be seen as part

of this postwar political trend.

These political and economic values, however, are not always justifiable from an ecologist's point of view. The ecologists challenge the government's scrap-and-build policy with their own values and show how to reduce residential CO_2 emissions. Designing with Nature, written by the Malaysian architect Ken Yeang, offers a framework for ecological architectural design in terms of the input and output of energy and resources.[2] His spatial comprehension is based on the distinction between "technosphere" and "biosphere". The following four sets define the interactions of a designed system with the technosphere and biosphere through a building's lifespan.

1. The external interdependencies of the designed system (its external or environmental relations).
2. The internal interdependencies of the designed system (its internal relations).
3. The external-to-internal exchanges of energy and matter (its inputs).
4. The internal-to-external exchanges of energy and matter (its outputs).[3]

Based on these sets, he proposes the following four possible design strategies. Each of their diagrams is shown in Figure 1.

1. The once-through system:
   Resources are input from the biosphere, and wastes are disposed in the environment "without consideration being given to their effects, the routes that they take, and their final sink". This system is based on "the assumption that there is an infinite resource base".
2. The open-circuit system:
   "The design makes full use of the resilience of the environment to provide the receiving sink for the residues".
3. The closed-circuit system:
   "The majority of the processes of the system are internalised" so that "all impacts on the location can be minimised.
4. Combined open/closed system:
   A system combining 2 and 3.[4]

In order to make architecture physically sustainable, the impacts on the biosphere should be minimised or at least kept within an extent that does not exceed the ecosystem's ability to deal with them. In this respect it is obvious that the once-through system, which wastes energy and resources without concern for recycling, should be shifted towards system 2, 3, or 4.

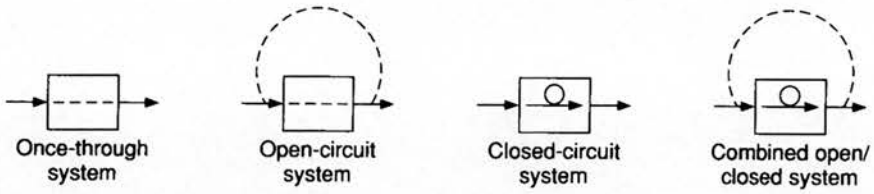


Figure 1: Patterns of use of energy and materials in buildings

Source: Ken Yeang, Designing with Nature: The Ecological Basis for Architectural Design (New York: McGraw-Hill, 1995), p. 198.

Yeang's design strategies offer a way of comprehending the relationship between architectural design and the balance of material demands and supplies in a project base. They also suggest a model for ecology-conscious architectural design systems linking the technosphere and biosphere in a regional context. In 2000 Japan's Ministry of Land, Infrastructure and Transport brought the Construction Materials Recycling Law into effect, and set to work on open-and closed-loop systems. For wood recycling the law encourages a closed-loop recycling system in the technosphere, such as by making particle board from discarded wood as an alternative construction material, and it sets a recycling target of 95% in 2010. Attaining that target, however, will require solutions to many problems including cost and technology. While the promotion of recycling itself is desirable, it cannot provide the crucial answer for scrap and build, which is at issue in this thesis.

To examine this scientifically, I will contrast the data of different lifetimes to calculate the impact of scrap and build on CO_2 emissions from the carbon stock in wooden detached housing. The architectural engineer Kanji Sakai analyses the CO_2 emissions per square metre at each of three stages — construction, use, and demolition — throughout housing lifetime under the old and new housing standards in Area IV (given in Chapter 3) as set by the government Housing Loan Corporation. Also, old and new housing standards are called "housing A" and "housing B", respectively, as shown in Table 1.[5] Two processes for a 60-year housing lifetime are premised according to the foregoing definition. In process 1, housing A in Area IV is scrapped after 30 years under the old housing standard, and replaced with housing B, which uses the new standard and has the same limited lifespan of 30 years. In contrast, process 2 shows that the old standard demands a structure usable for 60 years, thereby doubling housing lifespan. Although housing under the old standard increases CO_2 emissions from use, it does not cause CO_2 emissions by demolition and rebuilding. As a result, process 2

represents an 80% reduction of CO_2 emissions from process 1 over 60 years, which is realized through reduced energy inputs and outputs in construction and use.

Housing A	**Housing with the old standards (Area IV)**	Construction	76 kgC/m2
		Operation:	2.5 kgC/m2•year
		Scrap:	1.5 kgC/m2
Housing B	**Housing with the new standards (Area IV)**	Construction:	80 kgC/m2
		Operation:	1.5 kgC/m2•year

Table 1: Carbon stock and emissions over housing lifetime (comparison between the new and the old housing standards for Area IV)

Sources: Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings] (Tokyo: Kuki-Chowa Eisei-Kogakkai-Shinsyo, 1995), The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment] (1995), and The Architectural Institute of Japan, Kenchiku ga Chikyu Kankyo ni Ataeru Eikyo [Architectural Influence on the Global Environment], (1992).

This difference is summarised in Table 2. Moreover, since newer housing generally has a larger floor area than old housing, the efficiency gain is not always so high when calculated per square metre.[6] This means that the pursuit of higher living standards through higher energy efficiency and larger floor area can actually result in heavier energy consumption on the premise of a short housing lifecycle. Although this calculation is rough and ignores some factors such as housing maintenance, it is sufficient to describe the impact of scrap and build in short-lifespan housing. These calculations reveal that reducing CO_2 emissions from housing in use cannot always help reduce emissions throughout housing lifetime.

Process	Action	Calculation	Emission	
Process 1	Constructing houisng A		76 kgC/m2	Carbon stock in housing
	Operating housing A (30 years)	2.5 (kgC/m3•year) ×30 (years)	75 kgC/m2•30 year	
	Scrapping housing A		2 kgC/m2	
	Constructing houisng B		80 kgC/m2	Carbon stock in housing
	Operating housing B (30 years)	1.5 (kgC/m3•year) ×30 (years)	45 kgC/m2•30 year	
	Total 1		278 kgC/m2•60 year	
Process 2	Constructing houisng A		76 kgC/m2	Carbon stock in housing
	Operating housing A (60 years)	2.5 (kgC/m3•year) ×60 (years)	150 kgC/m2•60 year	
	Total 2		226 kgC/m2•60 year	
	(Total 2)/(Total 1)		81 %	

Table 2: Comparison of the two processes of housing construction and use

4.1.2 Imported wood

The increase of imported wood in the postwar period is another consequence of government policy. Postwar wood imports first came from the Philippines in 1948. After international trade began in 1960, the amount of imported wood increased dramatically until the Oil Crisis in 1973[7]. The second stage was marked by an increase in the import of softwood trees for building construction from the United States and Canada. This shift directly damaged Japanese forestry and gave imported wood a dominant position in the Japanese market. Yet, it was also encouraged by the Japanese government. A number of ports were built to receive imports and facilitate the shipment of imported wood throughout Japan. Large coastal processing mills, accounting for 15% of Japanese sawing production, were built to complement the ports.[8] These developments changed wood distribution completely, which had been based on domestic forestry until then.

In the 1980s, Japan's domestic product market was damaged further by a trade agreement between Japan and the United States, in which agreement on an open market policy for forest products was part of a diplomatic initiative to guarantee exports of Japanese cars and electrical products to the North American market. In this case as well, Japanese forestry fell victim to the postwar Japanese policy of focusing on technological development at the expense of all other considerations. Moreover, this liberalisation was extended to the housing market. After a top-level conference in 1985, Japanese building standards were revised in order to adapt them to the 2x4 timber commonly used for construction in North America.[9] The upshot was an increase in not only imported materials, but also imported housing construction techniques, producing yet another negative impact on preexisting housing construction methods and on the workforce skilled in those traditional methods.

The ecological implications of these political developments are considerable, and new criteria must be employed to assess them. Possible criteria for showing an ecological sense of value are offered by the concept of "environmental space", as proposed in the report Towards a Sustainable Scotland, published in 1996 by the Friends of the Earth Scotland. Environmental space is defined as:

> "the amount of a resources that may be equitably consumed without damage to the capacity of the planet for supporting other species and us."[10]

The definition is based on three criteria:

1. The capacity of the environment to absorb the waste stream
2. The lifetime of reserves
3. The carrying capacity of the local and global environments

Three principles guide this definition:

1. The Precautionary Principle

   "Where reasonable doubts are raised about the risks or the impact of a development proposal, unless it is demonstrated that a significant impact will not happen, measures should be taken to safeguard against such an event occurring."

2. The Equity Principle

   "...each country's share of the available resources (as defined by the environmental criteria) is defined by its population."

3. The Proximity Principle

   "...environmental problems should be solved as near to their source as possible. In other words, we should avoid improving our environment by exporting problems elsewhere"[11]

In applying the equity principle, wood consumption in Japan is analysed in comparison with the global average of environmental space. Annual Japanese wood consumption was 113.7 million m^3 in 1995, and the per capita consumption is calculated in this manner:

113.7 million m^3 (consumption) / 125.8 million (population) = 0.9 m^3/capita

According to the Sustainable Scotland report, the global environmental space of wood is calculated to be 0.3 m^3/capita, which is only a third of Japanese per capita consumption. Even though Japanese consumption is much higher than the global average, it would be acceptable as a characteristic of Japan's material use, providing that consumption does not exceed the regionally available supply and is sustainable as an open-circuit system. But in fact, resource consumption is far higher than domestic production and the global equity level, so the current situation can no longer be accepted as "characteristic" of Japanese housing.

Apart from material consumption itself, the high level of wood imports means greater energy

consumption for shipping. Owing to a lack of adequate data the AIJ report does not take into account the energy consumption and CO_2 emissions by the transportation of materials from abroad for housing construction. Yet, CO_2 emissions from transportation and their relationship to total construction emissions can be calculated on the basis of currently available data. Table 3 presents the results. Transportation is by lorry and ship, with the former mainly for domestic transportation, and the latter for international shipping. CO_2 emitted when transporting 1 ton of wood 1 kilometre by ship and lorry is calculated as follows:

Ship: 126 (kcal/t•km) • 0.8180 (tC/107 kcal) =1.03•10-5 (tC/t•km)

Lorry: 696 (kcal/t•km) • 0.7658 (tC/107 kcal) = 5.33•10-5 (tC/t•km)

Providing the distance for transporting imported wood to Japan by ship is 8,000 km because the main exporters are North American countries, and that carriage by lorry in the United States and Japan is 300 km, the CO2 emissions from imported wood transport can be calculated as shown in Table 3. According to Sakai's calculations, CO2 emissions from transporting domestic wood per ton are 0.0168 tC/t, making the emissions from imported wood nearly six times greater than those from domestic wood.[12]

Transportation for imported wood	**Ship**	1.03•10-5 (tC/km) • 8,000 (km)	0.0824 (tC/t)
	Lorry	5.33•10-5 (tC/km) • 300 (km)	0.0160 (tC/t)
	Total (A)	0.0824 (tC/t) + 0.0160 (tC/t)	0.0984 (tC/t)
Transportation for domestic wood	**Lorry**		0.0168 (tC/t)
	Total (B)	0.0824 (tC/t) + 0.0160 (tC/t)	0.0168 (tC/t)
	(A)/(B)		5.86

Table 3: Comparison of CO2 emissions from transporting imported and domestic wood

Using these results makes it possible to calculate the total CO_2 emissions per square meter floor space of wooden housing together with emissions from construction, which were discussed above. Sakai's analysis indicates that the amount of wood used per square meter is estimated to be 162 kg/m^2.[13] Therefore when imported wood is used, transportation-derived CO_2 emissions per square meter can be estimated as shown in Table 4.

Transportation for imported wood	**Ship**	0.0824(tC/t)×162(kg/m2)	13 (kgC/m2)
	Lorry	0.0160(tC/t)×162(kg/m2)	3 (kgC/m2)
	Total (A)		16 (kgC/m2)

Table 4: CO_2 emissions from transporting imported wood for wooden housing (per square metre)

Sources: The Ministry of Transportation, Unyu Sesaku [Transportation Policy] (1995).

As noted in Chapter 3, CO_2 emissions from wooden housing construction are 76 kgC/m^2, and those generated by shipping of materials within Japan are 20 kgC/m^2.[14] Adding the emissions from wood transportation outside of Japan (16 kgC/m^2) increases total transportation-related emissions to 36 kgC/m^2, which accounts for 39% of the total emissions produced by construction and transportation. Furthermore, CO_2 emissions from wood shipping from abroad constitute 44% of total Japanese transport-sector CO_2 emissions and 17% of Japan's total CO_2 emissions. This result shows that the transportation of wood by land and sea makes up a considerable proportion of total CO_2 emissions.[15]

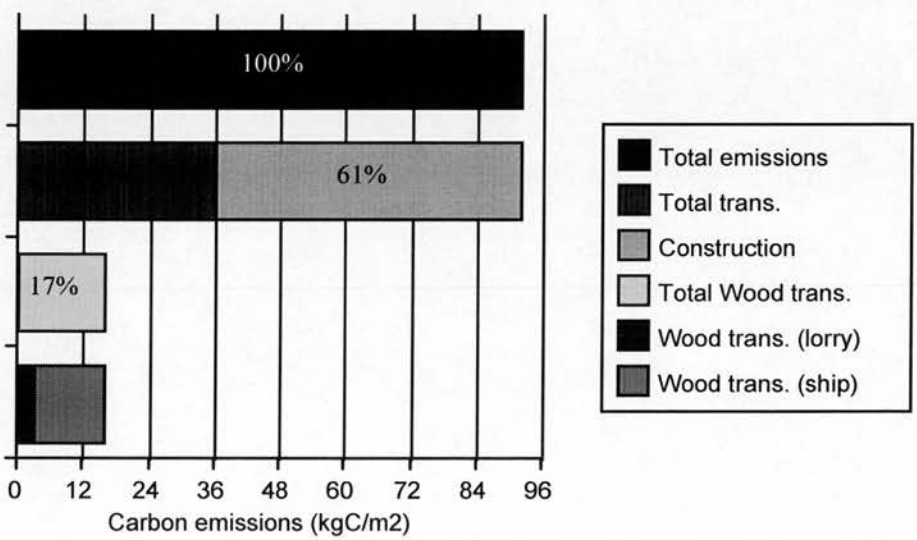


Figure 2: CO_2 emissions from wooden detached housing construction and material transportation

Sources: The Ministry of Transportation, Unyu Sesaku [Transportation Policy] (1995).

Since wood is a recyclable material and consumes less energy than other common building materials such as steel and concrete, optimising its potential requires that transportation distance be reduced. As long as the wood used for housing undergoes only simple mill processing, forestry and its related industries do not need large capital investments that in turn induce high CO_2 emissions. This means that transportation rather than processing is the major factor in energy consumption. Yet, an OECD report published in 1995 predicts that the increasing liberalisation of international trade will further lengthen transportation distances by widening distances between production and consumption sites. [16] This trend in international trade could augment energy and resource imports by the industrialised countries, which then affect the global environment by exporting their problems to the rest of the world. This obscures the responsibilities of each individual country.

One can therefore criticise Japan's high wood imports on two grounds. One is the equity principle, which advocates global equality in resource consumption, and the other is the proximity principle, which seeks solutions as near at hand as possible. At the same time, the uncertain impact of imports on CO_2 emissions and the little-developed methods for its analysis have led to the technocentric approaches that increase excessive material consumption on a global scale. However, a third principle — the precautionary principle — encourages people to take action for preventing problems that might arise. The above calculations should be sufficient to demonstrate the ecological impact of wood imports on the exporting countries and globally.

4.2 The "anthropology" of global environmental issues

The two issues of scrap and build and imported wood have brought ecologists to adopt a set of values different from that of economists in response to increasing CO_2 emissions. Yet, despite the persuasiveness of the ecologists' principles and their theoretical framework, their arguments cannot easily displace conventional socioeconomic theories. Because economic domination is supported largely by government policy, a practical shift in policy is highly unlikely. Additionally, individual perceptions of global environmental issues are also influenced by economic conceptions. Such being the case, the dominant economic power structures not only frustrate ecological sustainability, but also distort the information on the issues available to individuals, thereby restricting opportunities for debate between the two points of view. Because Geddes defines the perception of the current

conditions in daily life as "anthropology" in the Notation of Life, the current Japanese awareness of CO_2 emission increases and Japanese viewpoints on this issue can be located symbolically in "Acts".

4.2.1 The dual structure of the Japanese perception of global environmental issues

Recent Japanese values have been calling the dominant materialist democracy into question. The prevailing indices of success from the 1950s were founded on the ownership of consumer durables as a measure of the increasing standard of living. But Japanese values in the 1990s have been shifting from pursuing the simple cycle of mass production and consumption towards satisfying a diverse range of individual demands.[17] Half a century after the end of the war, Japan's postwar generation outnumbers the prewar and wartime generations. The younger generation has expectations differing from those of their parents and grandparents, who tended to evaluate their quality of life in terms of economic growth and material consumption. The "I want" ideology of the younger generation is not necessarily predicated on economic growth.

Yet, this diversity of individual desires does not guarantee a wider awareness of environmental issues. The current perceptions of individuals toward reducing CO_2 emissions are influenced by the conditions of the individual's environment. In the Japanese context, it can be explained by a dual structure: a detachment from reality due to domination by virtual images, and the pursuit of freedom through technological developments. A general example of this structure can be seen in a 1995 public opinion poll which showed that nearly half (42%) of the Japanese are aware of global environmental issues such as global warming. This figure has been stable since the survey was launched in 1992, although it is higher than the 20% of 1988. Half (45%) worry about climate change induced by increased atmospheric CO_2, yet 58% think that industrial activities are more responsible than individuals.[18] This shows that the individual's understanding of global environmental issues is evoked when the natural phenomenon explained scientifically. This understanding is, therefore, not always associated with the individual's daily life, but rather being out of touch with reality.

Owing to this situation, individuals tend to separate practical solutions for such issues from their daily lives, which allows them to satisfy their desire to attain current living standards. In the same opinion poll, although 74% feel that we should revise our consumptive lifestyle, nearly 60% want to maintain current living standards or think optimistically that an increase in living standards is compatible with environmental protection. In addition, only 27% think that global environmental

issues should be given priority over economic growth. In answer to the question "To which fields should science and technology contribute?", nearly 70% say "global environmental protection", followed by 62% calling for "effective energy use", 58% for "recycling" and "development of natural resources and disposal of wastes". These results reveal that many people look to technological developments for solutions to environmental issues.[19]

This dual structure is also revealed in the fundamental way people perceive wooden housing. On a practical level, wood has a strong attraction even for the younger generation. The Japanese see wood as a healthful material, and there is increasing awareness of currently increasing indoor environmental pollution, which is caused by increasing airtightness and by the use of harmful materials. As a natural material, wood has benefited from the trend towards health-oriented design, which is supported by progress in scientific research on the human health impacts of various building materials. A September 1996 opinion poll showed that 70% of Japanese prefer traditional Japanese housing. When asked the reasons for their preferences, 65% responded that the ventilation and insulation of Japanese housing are better suited to Japan's climate.[20] On a symbolic level, the mass media and virtual representations of unspoilt ecosystems promote the perception of wood and other natural materials as desirable building materials that might counter the physical and mental damage caused by harmful material use. This identification of wood with health and nature is also reinforced by Japanese tradition and history.[21]

But this picture is produced by manipulated images rather than factual data, and leaves the public ill-informed. Such images have little to do with the Japanese forestry crisis. Although the domestic wood supply is declining dramatically, the September 1996 public opinion poll shows that nearly 60% of the Japanese still believe that Japan is self-sufficient in wood, and are unaware of the volume of imported wood.[22] Also, the positive images of wood come from forests — nature. As Shinsyu University's Satoshi Sugahara points out, the disparity between the public image of forests and their actual state reflects a separation from the traditional process of production and consumption. People no longer experience forests through practical use, but see them through the lens of media such as television and photographs.[23] For example, the opinion poll quoted above shows that more than 90% of the Japanese feel close to woods and forests, and that more than 60% have actually visited forests. Yet, the major purpose of visiting is "to view" them rather than "to experience" them for practical and

industrial activities.[24] Sugahara claims that contemporary communing between man and nature in Japan is conducted through such media as television and photography, and even through viewing real forests only from the cars.[25] Paradoxically, the fashionable preference for wood as a housing material and the perceived positive images of forests actually serve to increase the demand for imported wood.

The individual's pursuit of freedom is permitted by technological development, and individuals are motivated to consume more in the pursuit of higher living standards. At the same time, their preferences are induced largely by virtual images of nature and ecology through the media, which legitimate individual impacts on the global environment.

4.2.2 From "Acts" to "Facts": Tokyo and Hokkaido

Having surveyed the general public's perceptions of the relationship between global environmental problems and daily life, this chapter will now narrow its focus to the regional level because perceptions are influenced largely by local factors that determine housing design. The two regions of Tokyo and Hokkaido are chosen for their contrasts in climate, natural resources, and population density. Administratively, Metropolitan Tokyo is divided into 23 wards (*ku* in Japanese), while Hokkaido is administered by its capital, Sapporo. Each of the two regions is shown in Figure 3.

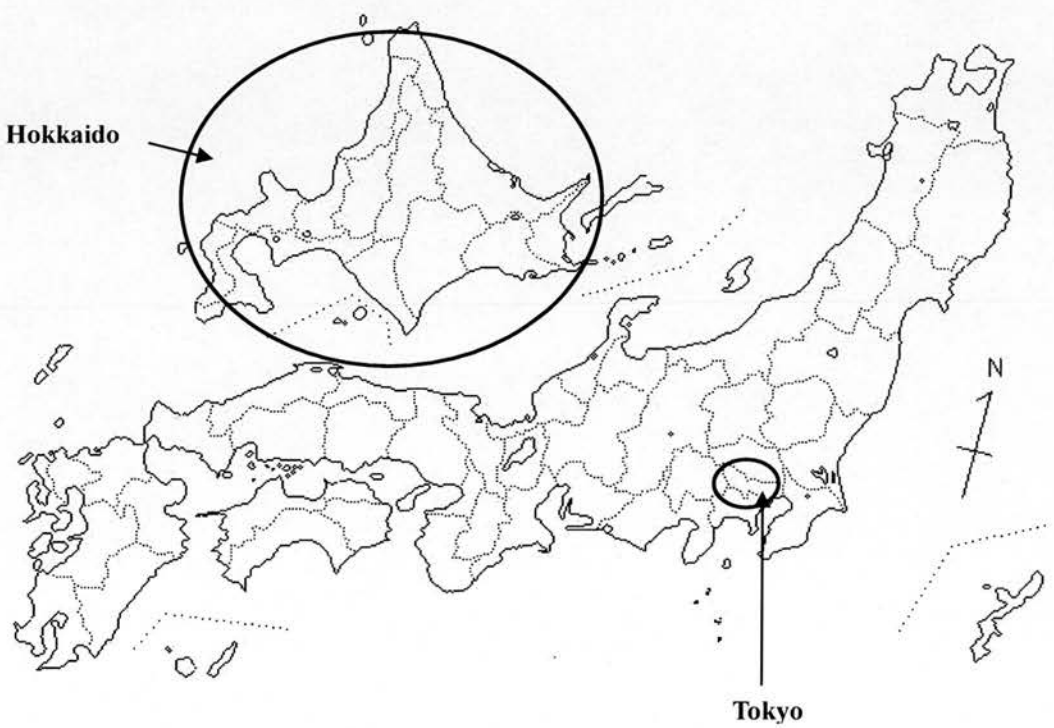


Figure 3: Map of Tokyo and Hokkaido

To determine the relationship between the physical conditions that affect housing design and people's attitudes to it, I have chosen three key elements of housing: material, form, and technology. As the principal material of Japanese detached housing, wood is discussed in the context of the regional balance between material supply and demand. This relationship differently influences people's perception of wood as both forest habitat and products, according to regional conditions. Housing form is determined not only by regionally available materials, but also by regional climatic factors. Finally, housing technologies are developed in order to provide more comfortable indoor environments under these climatic conditions.

The following discussion contrasts the two regions' conditions in terms of the three elements, and by this means characterises the two issues of scrap and build and imported wood in each region.

Wood

As an ecologically friendly material for detached housing in general, wood has had different meanings in relationship to each region. While Hokkaido is characterised by its abundance of natural resources, Tokyo is Japan's largest consuming area. The 531 km^2 of forested land in Tokyo is only 30% of its total 1,781 km^2 land area, whereas buildings cover more than half. In Hokkaido, on the other hand, 55,800 km^2 are forested, which is 22% of Japan's total area and 71% of Hokkaido, higher than the national average of 67% forested area. As an indication of the regions' differences in wooded area, Tokyo produced 14 thousand m^3 of wood in 1995, which was less than 1% of Hokkaido's 4,372 thousand m^3.

A look at the regional balance of supply and demand shows that the Japanese milling market is divided into three categories: the mass-consumption market, which relies on a material supply outside of the market area: the regional-consumption market, which sustains a self-sufficient material supply within an area: and the middle-consumption market, which is a combination of the first two.[26]

Historically, the "Tokyo Market", which includes Tokyo, Kanagawa, Saitama, and Chiba prefectures, has developed as the first type, i.e., the mass-consumption market, because of area's centralised population and its higher construction demand, which was satisfied by providing the Tokyo market with wood from all over Japan.[27] Currently, wooden detached housing is being replaced by reinforced concrete flats as the principal element in housing stock. Tokyo's 1998 dwelling stock

was 5.7 million units, and the percentage of detached housing was only 30.3%. Increasing land prices have made it difficult for individuals to build detached housing. Consequently, wooden housing, which accounted for 64.9% of total dwellings in 1983, decreased to 50.5% in 1993, and to 46.5% in 1998. From 1991 until 1995, between 155 and 168 thousand housing units were built annually. In 1995 only 32 thousand wooden detached housing units were built, which was 21% of total construction. This showed the increasing domination of non-wooden housing construction.[28]

Although wood demand for housing construction has been declining, the total demand of the Tokyo market still greatly exceeds its limited regional supply. Wood supplied to the Tokyo market has three sources: the regional supply from within Tokyo, the domestic supply from the rest of Japan, and imports from abroad. In 1991 the major prefectures shipping milled timber (more than 50 thousand m^3) to the Tokyo market were Fukushima, Wakayama, Hokkaido, Shizuoka, Toyama, Akita, Ehime, Tokyo, Nagano, Iwate, Hiroshima, and Fukuoka, thus indicating that the domestic supply from other prefectures was far larger than Tokyo's annual production of 14 thousand m^3. [29] Also, the approximately 2,000 thousand m^3 that transited customs each year at Tokyo port in the 1990s indicates the domination of imported wood in this area. Although these supplies to the Tokyo market from other prefectures and abroad do not equate to the demand in the same area, they are one indication that wood production in Tokyo has little impact on the regional market. Because local demand far outweighs the local supply, it would be impossible to expect the Tokyo market to increase its reliance on the local wood supply. The large number of producing areas that ship domestic wood to the Tokyo market make it difficult for people to see the connection between production and the consumption. As a consequence, Tokyo is losing its significance as a wood-producing area.

In contrast with Tokyo, Hokkaido's wood market has been a medium-consumption market. Its supply is divided largely into two parts: the regional supply from within Hokkaido and imported wood. Hokkaido's location between 41 to 45 degrees north latitude in the Boreal zone gives it different wood types from those on the main island, where Japanese cedar and Japanese cypress are traditionally favoured for housing construction, and, in spite of their high price, still dominate the market thanks to their structural strength, durability, and beauty. In contrast, the principal building wood species in Hokkaido are Ezo spruce, *todo* Fir, and Japanese larch, which have similarly stimulated a regional market within Hokkaido.[30] Hokkaido's stable milling demand reflects its strong demand for wooden

buildings. The northern island's housing stock was 2.0 million in 1993, when 1.1 million units, or 55%, were detached housing. The number of wooden dwellings was nearly 1.5 million, which is more than 70% of the total stock, showing the domination of wooden structures in Hokkaido's housing market. Current annual construction demand for wooden housing is approximately stable at around 45 to 50 thousand, remaining around 60% of the total annual construction demand.

Hokkaido's major wood production areas are divided into the four areas with the largest production: Abashiri, Kamikawa, Iburi, and Tokachi. As shown in Figure 4, they account for more than 60% of the timber shipped to the central area in Hokkaido including Sapporo. This strong relationship between the producing and consuming areas is one of the characteristics of wood distribution within Hokkaido.[31]

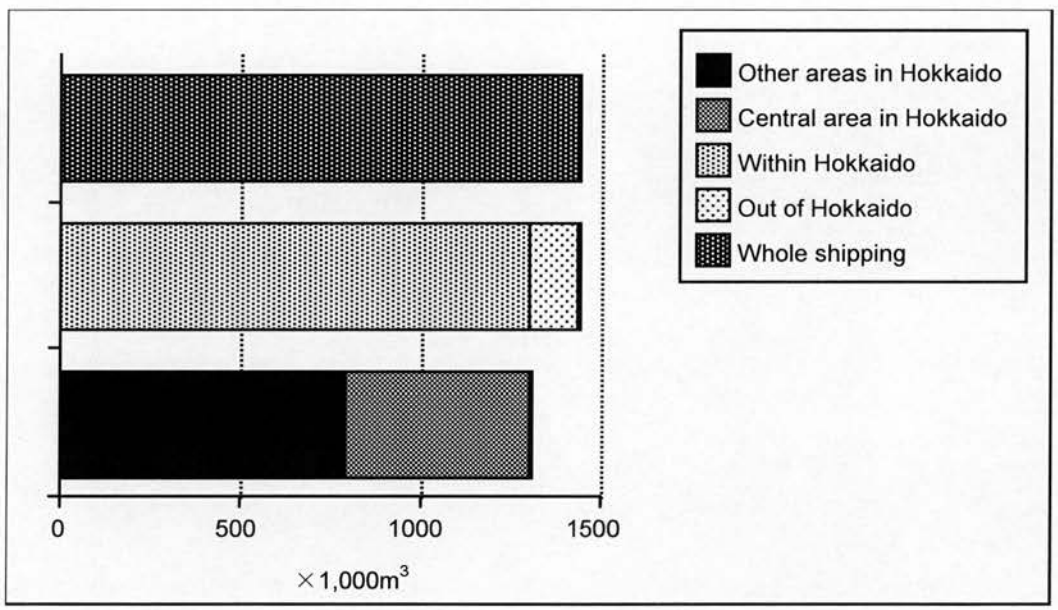


Figure 4: The shipping amounts of Ezo spruce and todo fir (by area)

Source: Hokkaido, Hokkaido Ringyo no Doko [Hokkaido Forestry Trends] (Hokkiado: Hokkaido Ringyo Fukyu Kyokai, 1996).

Historically, forestry in Hokkaido had its origins in the Meiji Restoration during the last third of the nineteenth century, with the perception of forestry tied to the capitalist notion of value. A manifestation of this attitude has been continuous, excessive logging that has induced the current decline of forestry. Ecological sustainability takes a back seat to the primary concern of achieving regional economic sustainability through the exploitation of regional resources. The increasing

intensity of postwar economic development led to an ever-increasing demand for wood that peaked at 14 million m^3 in 1973. Regional wood production was increasing to satisfy demand. Hokkaido was self-sufficient in wood until 1960 when wood imports started. Nearly 11 million m^3 of wood were produced at the peak in 1972, after which production declined as a result of excessive felling in the 1950s and 60s while cheaper imported wood increased its dominance. Hokkaido's self-sufficient supply was in fact achieved through excessive and ultimately unsustainable logging that steadily depleted its forests. As a result, 1994 production was only 45% of the peak volume of 1972.[32] Hokkaido's imports, on the other hand, increased rapidly from 2% of the total supply in 1960 to 32% in 1973 by virtue of mass production and automated processing. Currently, regional demand is stable at around 11 million m^3, and by 1994 imports accounted for 57% of the total supply.

Although wood imports are increasing, current annual growth of Hokkaido's total forests is around 13 million m^3, mainly in plantations. Since annual demand is stable at around 11 to 12 million m^3, it is theoretically possible to maintain production at 11 million m^3 per year and achieve self-sufficiency by continuous afforestation.[33] In order to produce plantation wood, a greater expenditure of labour for afforestation and maintenance is inevitable. Yet, forestry is no longer profitable enough because of the lower price of imported wood.

The concept of "forest conservation" has developed in Hokkaido since the late nineteenth century in response to high-volume logging. In 1877 the Hokkaido government promulgated a law so that people would recognise the public function of forest reserves. By the time this law was reviewed in 1897, a large area of forests had been preserved for public use, and the registered areas were categorised as "forest reserves", where logging is prohibited. In 1995, there were 2 million hectares of registered forests in Hokkaido, accounting for 36% of the prefecture's total woodland. Hokkaido also created two regulations on "natural monuments" and "natural parks" to stem the disruption of the ecological balance, which has a direct impact on animal lives and natural scenery. "Natural monuments" were designated to protect certain species and their natural habitats that are threatened by industrial and other human activities. Those species and habitats are registered under the name "natural monuments", and are protected from harmful activities. Hokkaido's first six areas were registered in 1921, and currently the total registered area is more than 40 thousand hectares. "Natural parks" were established in order to preserve natural beauty according to both aesthetic and ecological

judgments. Natural park area is 713 thousand hectares, which is 13% of the total woodland in Hokkaido.[34]

Ironically, the environmental conservation that evolved in response to excessive logging by the forestry industry has led ultimately to further environmental degradation. While economic pressures have reduced the species diversity of commercial forests, the postwar expansion of the leisure industry has been affecting Hokkaido's natural resources. Due to the natural beauty of Hokkaido and the national increase in economic wealth, increasing numbers of tourists visit Hokkaido to see and enjoy its scenery. Rising tourism demand has accelerated the development of leisure facilities, thereby leading to more infrastructure in the forests.[35] In the 1960s, Hokkaido actively encouraged the increase of visitors because the leisure industry contributed increasingly to the regional economy. Yet, this continuous development has resulted in environmental degradation such as the erosion of natural habitats owing to increased traffic and the large amount of litter left by the many visitors. In response to these pressures, the 1973 Natural Environmental Preservation Law aimed at putting more emphasis on environment-friendly development.[36] Yet, the recent so-called "bubble" economy from the late 1980s to the early 90s fuelled huge leisure development projects all over Japan, and Hokkaido was no exception. In spite of the increasing number of environmental pressure groups, legal controls are restricted to particular areas of the forests, which means the concept of "natural preservation" is symbolic. Economic pressures are still exerted, however, to transform the remaining less economically valuable areas into more profitable leisure areas.

In both Tokyo and Hokkaido, connections are weakening between wood producing and consuming areas. Even in Hokkaido, which still has plentiful natural resources, such weakening ties are manifested as a serious environmental problem caused by importing wood. This problem is rooted in the artificially created image of forests as something to look at, which seems to have come from a shallow consensus between economists and ecologists. Economists have succeeded in shifting the primary use of forests from forestry, an industry in crisis, towards the development of leisure industries to create alternative venues for the regional economy and job opportunities. On the other hand, the dominant motivation of ecologists is nature preservation to protect habitat. Although the motivations of economists and ecologists differ, their demands can be satisfied by preserving only the forest areas whose uses are restricted. Conserved regional forests are used by the media as a symbol of

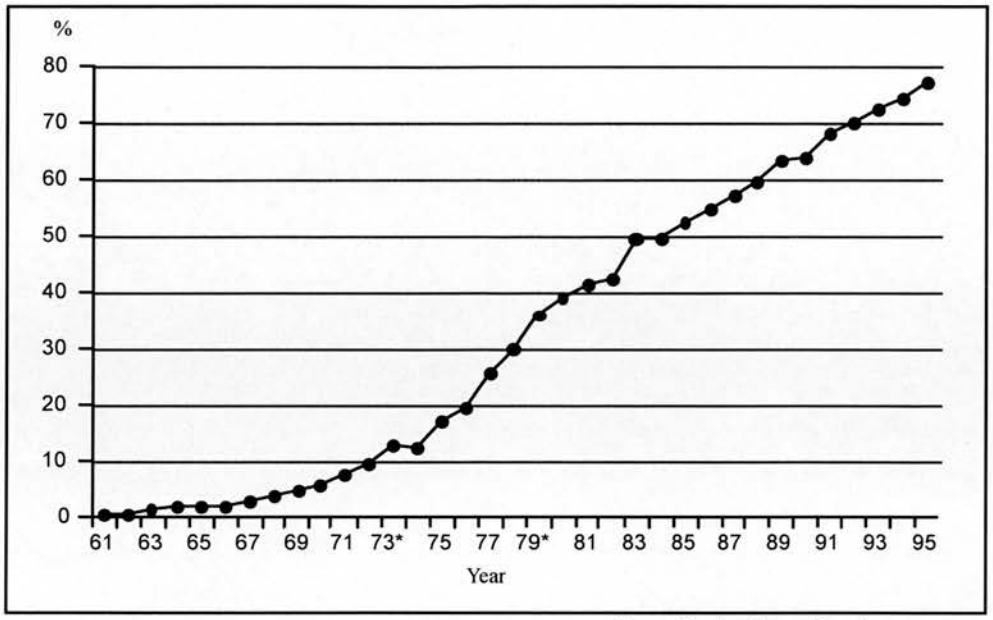
nature preservation to accelerate a predilection for "visual nature" among the citizens, thus helping the regional economy. At the same time, visual images of the forests shroud the reality of the environmental degradation that results from the forests' popularity, and the consequence is excessive wood consumption by people who want to recreate images of nature in their own homes. This public perception, however, will not bring about a solution to the current imported wood problem of exporting domestic environmental degradation in order to protect regional resources.

Form

Traditionally, housing form is dominated by natural factors. It is perceived differently in each region. Geographically, Tokyo is situated at 36 degrees north latitude, while Hokkaido is between 41 and 45 degrees north. Tokyo is in the same region as Kyoto, where the traditional style of Japanese housing was developed. It is characterised by long eaves and an open layout, designed to secure comfort in the hot and humid seasons from June through September. These characteristics are represented in a famous statement in "Essays in Idleness" (Tsurezuregusa) by the Japanese writer Kenko Yoshida (1283?-1350?):

"A house should be built with the summer in mind".[37]

The eaves shade the house from direct sunlight in the hot summer, while the open layout allows through-drafts. Yet, these dominant architectural characteristics are disappearing from current housing design due to the spread of air conditioning, which provides a comfortable indoor environment without relying on good ventilation. Figure 5 shows the diffusion of home air conditioning systems in Japan. Their use has increased continuously since the early 1960s, except for a brief dip just after the 1973 oil crisis. At present nearly 80% of homes have air conditioning, whose sales are stimulated by steadily decreasing prices and low operational costs, as well as increasing consumer income.[38] The technological development of air conditioning alone has helped emancipate housing from traditional styles primarily.



* marks the two oil crises.

Figure 5: The diffusion of home air conditioning systems in Japan

Source: The Economic Planning Agency, Kokumin Seikatsu Hakusyo [Annual White Paper on Life in Japan] (1995), p. 374.

Before the Meiji Restoration Hokkaido housing was built according to traditional styles, but those houses were unsuited to the harsh climate in Hokkaido, and this inevitably led to the idea of inventing alternative regional architectural styles. In accordance with the modernisation programmes of the Meiji Restoration, Western architectural ideas were introduced into Hokkaido as a way of adapting traditional styles to the severe climate. Under government regulations, all public buildings in Sapporo, the capital city of Hokkaido, were built in the American style, which is more airtight and less open. This also had a strong influence on private housing design, but spite of this trend, Western architectural styles did not adapt well to Japanese construction techniques.[39]

Postwar housing design in Hokkaido is divided into three periods according to Fujio Adachi, a professor at Hokkaido University. In the 1960s, during the rapid recovery of the Japanese economy, the Hokkaido Housing Supply Corporation had the primary role in housing supply. So-called "triangle-roof" housing was built using concrete bricks on a simple rectangular plan with a triangular roof. This simple roof design, which was conceived by the corporation, created a unified and rhythmical townscape in residential areas. The 1970s, however, is called the "chaotic period". In 1969, wooden housing was approved in applications for government housing loans because of the improvement in insulation standards, and since then wooden housing has been increasing rapidly in

Hokkaido. Wooden housing offers more freedom than concrete brick housing to create plans, and it is also cheaper to build. These advantages allow people to realise whatever forms they want. The results merely confirmed that a design free-for-all could not create a regional housing style or a unified townscape. In the 1980s, two types called the "flat roof" and "steep roof" were the major trends. Flat-roof housing was suitable for building on small urban lots because less snow would fall off the roof. The steep roof quoted its design from Western architecture and gave housing an exotic image. Yet, this does not signify a housing trend that is converging towards these two styles since the experiments of the 1970s. Instead, it is merely indicative of current individual preferences and demands in housing design.[40]

Housing design in both Tokyo and Hokkaido has been liberated from history and from the accumulated traditions of those places, and it is assuming forms that satisfy individual demands associated with living space. In other words, personalised demands disassociated from both geographical factors and traditional forms no longer seek a common housing style, and instead shift from one fashion to the next. Housing forms have departed from traditional styles in response to technological developments in Tokyo, and for climatic reasons in Hokkaido. Yet, in both regions, there has been little consensus on the development of alternative forms, and styles have become the basis for endless scrapping and building in order to satisfy ever-changing housing demand.

Technology

Good insulation and airtightness are the chief elements of current technocentric approaches to reducing the energy consumption of wooden housing. They have been developed in response to Hokkaido's severe climate. Comparing temperatures in Tokyo and Sapporo shows that the average monthly temperature in Tokyo is a minimum 5 degrees higher than that of Sapporo in August and a maximum of 11 degrees higher in January. Also, in Japan the season from June through early July is called "the rainy season", when Tokyo has somewhat higher humidity and temperatures, making the more uncomfortable. Hokkaido's lack of a rainy season means its humidity is relatively low. Thus winter cold is a stronger motivation than summer heat and humidity for Hokkaido residents to build new housing to a higher standard. For example, in a 1995 housing survey conducted in Hokkaido, 23.5% of respondents gave "cold houses" as the crucial reason for rebuilding, which was next to "age"

at 35.3%. When asked for three major reasons, 59.3% of respondents cited "cold", next to 66.7% for "age".[41]

Historically, electricity and heating expenses have represented a high percentage of total household expenses. Such expenses in Hokkaido were more than twice those of the national average in the 1950s, thereby constituting a heavy burden on daily life. With the increase in income from the late 1950s to the 1960s, heating costs as a percentage of total expenses declined in relative terms, but housing standards such as insulation were little improved.[42] Until the 1960s, the main heating fuel was locally available coal, although it was more expensive than oil. The shift from coal to oil for the main fuel during the 1960s brought about a significant reduction in heating expenses. Figure 6 shows that the number of homes heated with coal in 1965 had fallen by half in 1970, while gas and oil usage increased rapidly. Despite the lower cost of heating with oil, quickly rising oil costs during the two oil crises in 1973 and 1979 did much to raise the people's consciousness regarding thermal efficiency. The 1979 crisis, in particular, led to marked increases in domestic heating bills.[43]

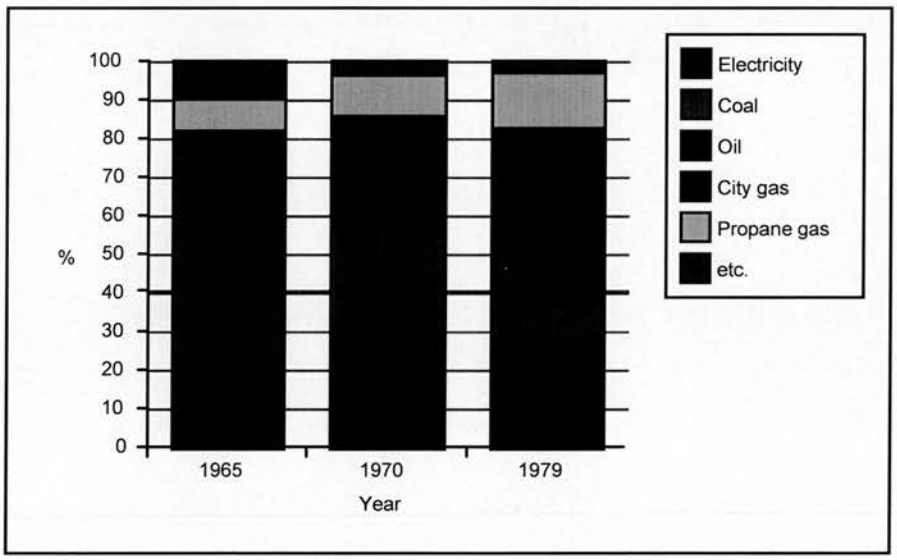


Figure 6: Fuel types used for space heating in Hokkaido

Source: Hokkaido, Domin Sekatsu Hakusyo: Domin Sekatsu no Sengo 50 Nen [Annual White Paper on Life in Hokkaido] (1995), p. 75.

Research on heavy insulation and airtightness started with the oil crises, which made people conscious of saving energy. Originally, universities and local governments in Hokkaido developed heavy insulation and airtightness as part of their research programmes. This research has been done mainly by Norihiko Kamata at Muroran Institute of Technology in Hokkaido, who is one of the

leading researchers in this field. A government research institute called the Hokkaido Prefectural Cold Region Housing and Urban Research Institute has also played one of the main roles in developing alternative technologies. This research has been continued through practical application of the technology in which the Research Council for Alternative Wooden Housing Technologies, known also as the Alternative Housing Council (AHC), has played a significant role. It started for the purpose of implementing techniques for heavy insulation and airtightness in wooden housing in Hokkaido and the northern part of Honshu. This non-profit organisation has contributed to promoting wide use of these techniques and to increasing housing standards in Hokkaido. Currently the techniques are employed in almost 100% of homes.

In Tokyo the significance of heavy insulation and airtightness differ from those in Hokkaido. Since Tokyo winters are less severe than those of Hokkaido, Tokyo residents have much lower heating expenses. Hot and humid summers are rather easily coped with by means of air conditioning units with expensive purchase and operation costs. The per-unit costs of different energy sources and of energy consumption for space heating and cooling in Tokyo and Hokkaido are shown in

Table 5[44].

Oil		9.3 yen/Mcal
Electricity		20.9 yen/Mcal
		860 kcal/kWh
Sapporo	Heating	14,000 Mcal/year
	cooling	- Mcal/year
Tokyo	Heating	3,000 Mcal/year
	cooling	500 Mcal/year

Table 5: The per-unit costs for space heating and cooling in Tokyo and Hokkaido

Source: The Architectural Institute of Japan, Lifecycle CO_2 de Tatemono wo Hakaru: Tatatemo no Kankyo Fuka Hyoka no Tebiki [Measuring Building by Lifecycle CO_2] (1997), p. 3.

The main fuel for heating is oil, followed by city gas in both Sapporo and Tokyo, while electricity is the dominant energy type for residential air conditioning. On a cost-per-unit basis, the annual expenses for heating and cooling in Tokyo and Sapporo mentioned above are shown in Table 6.

Sapporo	Heating (A)	14,000(Mcal/year)×9.3(yen/Mcal)	130,200 yen/year
	cooling		- yen/year
Tokyo	Heating (B)	3,000(Mcal/year)×9.3(yen/Mcal)	27,900 yen/year
	cooling (C)	500(Mcal/year)×20.9(yen/Mcal)	10,450 yen/year
A/B			4.7
B/C			2.7
A/C			12.5

Table 6 : The annual expenses for heating and cooling in Tokyo and Sapporo

Oil heating expenses in Sapporo are nearly five times higher than those in Tokyo (see A/B), revealing high heating expenses in Hokkaido. Also, cooling expenses in Tokyo are less than half those for heating (see B/C), and less that one-tenth those for heating in Hokkaido (see A/C). These results indicate that cooling in Tokyo is not as heavy a financial burden as heating in Hokkaido. Since Tokyo residents can obtain a comfortable indoor environment at little expense by installing air conditioning, heavy insulation and airtightness are not so crucial.

Persuading enough people to adopt a technology requires that they be convinced it is worth the trouble and expense, and here advertising plays the primary role. Three arguments are favoured in housing companies' advertisements: "economy", "comfort", and "health". "Economy" means less energy consumption for heating and cooling, and thus lower expenses. "Comfort" means two things. First is the comfort of a home itself by having a steady indoor temperature. Second, that comfort can be created without disturbances from external environmental factors by shutting out noise and air pollution. "Health" means that 24-hour air conditioning systems can lower humidity and alleviate high temperatures, thereby reducing the propagation of microorganisms that have adverse health effects such as allergies.[45] Figure 7 shows an example of the advertisements made by a housing construction company.

These advertising arguments are consistent with the so-called "earth-friendly" images projected by the companies. Because of rising consumer consciousness of global environmental issues in society, companies' eco-friendly images are becoming more important for selling their products. The media easily commandeer people's concerns for the global environmental, and whether the products are really ecologically friendly or not is no longer important. This trend is also very obvious from the key words in the advertisements, such as "ecology", "earth", and "green", as well as from the pictures and illustrations of nature in the advertisements. Nevertheless, companies are more concerned with

protecting their corporate images than protecting the environment, which makes global environmental and ecological issues less political, less powerful, and more symbolic.[46]

Rainy season　　Winter　　Year round

Figure 7: Advertisement for heavily insulated and airtight housing

Source: Pamphlet of a housing construction company

In a practical sense, the Network for Energy conservation and Ecological Housing Practice (NEHP) is also deploying heavy insulation and airtightness technology around the Metropolitan Tokyo area. Similarly to AHC in Hokkaido, NEHP builds a network among customers, architects, housing builders, manufacturers, and research institutes. This network not only advocates alternative housing technologies, but also seeks to promote awareness and understanding of their relationship to ecology and global environmental issues. Yet, NEHP's main concern is more complex than that of AHC in Hokkaido. NEHP was set up by the Tokyo Electric Power Company (TEPCO), an electric utility serving Tokyo and its surrounding area. One of the company's major concerns is the large difference between the highest and lowest levels of electricity demand over the year. Basically,

electricity supply is planned according to the highest demand of the year. Recently, this demand in Tokyo has been increasing rapidly because of heavy air conditioning use during the afternoons of the hottest summer days. Consequently, the gap between the highest and the lowest demands has likewise been widening, leading to over-investment in power plants to satisfy the highest demand, thus reducing the cost efficiency of each individual plant. In 1995, when the highest demand had become more than double the lowest demand, TEPCO set up a Demand Side Management (DSM) Centre to reduce excessive electricity consumption, especially during the summer peak. NEHP is one of the activities of the centre, which aims to reduce peak residential electricity consumption by applying various techniques such as good insulation and airtight construction, as well as passive and active solar systems.

Heavy insulation and airtightness, therefore, enjoy the support of both TEPCO and consumers because they contribute both to the company's cost efficiency and to the running costs of homes, and they are marketed through the media under the name of ecology. While the reduction of excessive investment in generating capacity does help reduce CO_2 emissions, it obscures the relationship between human activities and their climate change impacts.

4.2.3 The unique links between issues and regions in Tokyo and Hokkaido

An analysis of the three elements of housing, i.e., wood, form, and technology, in Tokyo and Hokkaido, has shown that people's current circumstances prevent them from correctly perceiving global environmental issues. Popular perceptions gained through the media are not grounded in reality, but rather the illusion arising from the prevailing economists' value claims.

This illusion reveals itself differently in each region as a reflection of that region's unique characteristics. In Tokyo, good insulation and airtightness are perceived as means of realising a more comfortable indoor environment in the hot and humid summer. Although this trend is motivated by information that these technologies help reduce CO_2 emissions from housing, the real reason is that housing construction companies want people to rebuild their homes, and as a result, this trend is increasing CO_2 emissions by accelerating scrap and build. In Hokkaido, natural beauty is favoured by both the economists, who seek alternative regional industries that will lead away from conventional forestry, and by the ecologists, who advocate nature conservation. Separating the reality of regional forestry industries from the popularly held positive images of wood has induced an increase in wood

imports even in one of Japan's major wood-producing regions.

This Tokyo/Hokkaido analysis illustrates a limitation of Geddesian theory as a modern theory that might be applied to contemporary society. The "Acts"-"Facts" process in our present society is merely separating the individual's perception of housing from the two environmental issues of scrap and build and wood imports, and is consequently leading society in the direction of excessive consumption in order to sustain the economy. This trend, at the same time, overshadows ecological sustainability by interpreting its meanings within a framework defined by the pursuit of economic growth. This will make it hard for people to perceive environmental issues in daily life. Being out of touch with reality owing to the influence of virtual images allows people to follow their own desires without contradicting their own increasing awareness of global environmental issues. The gap between personal desires and environmental concerns is mediated by the technological developments of good insulation and airtightness. In this way a duality manifests itself in the individual's perception of housing.

---

1 The Ministry of Construction, Kensetsu Hakusyo [Construction White Paper] (1996), p. 243.

2 Ken Yeang, Designing with Nature: The Ecological Basis for Architectural Design (New York: McGraw-Hill, 1995).

3 Ken Yeang, Designing with Nature: The Ecological Basis for Architectural Design, p. 79.

4 Ken Yeang, Designing with Nature: The Ecological Basis for Architectural Design, pp. 187-211.

5 See: Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings] (Tokyo: Kuki-Chowa Eisei-Kogakkai-Shinsyo, 1995), The Architectural Institute of Japan, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment] (1995) and The Architectural Institute of Japan, and —, Kenchiku ga Chikyu Kankyo ni Ataeru Eikyo [Architectural Influence on the Global Environment], (1992).

6 The average floor area of detached housing in 1995 was 137.4 m^2, about 20 m^2 (31%) larger than that 20 years before in 1975 (104.8 m^2).

7 Yoshitomo Ando, Mokuzai Shijoron: Sengo Nippon ni okeru Mokuzai Mondai no Tenkai [Wood Market: The Evolution of Wood Issues in Postwar Japan] (Tokyo: Nippon ringyo chosa-kai, 1992), pp. 261-2.

8 Yoshitomo Ando, Mokuzai Shijoron: Sengo Nippon ni okeru Mokuzai Mondai no Tenkai [Wood Market: The Evolution of Wood Issues in Postwar Japan], pp. 263-6.

9 Yoshitomo Ando, Mokuzai Shijoron: Sengo Nippon ni okeru Mokuzai Mondai no Tenkai [Wood Market: The Evolution of Wood Issues in Postwar Japan], pp. 263-6.

10 Friends of the Earth, Towards a Sustainable Scotland: a Discussion Paper (1996), p.5.

11 Friends of the Earth, Towards a Sustainable Scotland: a Discussion Paper, p. 8.

12 See: Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings].

13 See: Kanji Sakai, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings].

14 See: Chapter 3, p. 81.
15 See: The Ministry of Transportation, Unyu Sesaku [Transportation Policy] (1995).

16 OECD, Boeki to Kankyo: Boeki ga Kankyo ni Ataeru Eikyo [Environmental impacts of Trades] (Tokyo: Cyuo-hoki syuppan, 1995), p. 235.

17 The Science and Technology Agency Shigen Cyosakai, Toshi ni okeru Energy Riyo ni Kansuru Cyosa Hokoku: Johoka no Shinten no Nakade [Research on Energy Use in Urban Areas] (1996), p. 126.

18 See: The Prime Minister's Office, Gekkan Seron Cyosa "Kankyo Hozen to Kurashi" [Public Opinion Poll: Environmental Conservation and Daily Life] (September 1995).

19 See: The Prime Minister's Office, Gekkan Seron Cyosa "Kankyo Hozen to Kurashi" [Public Opinion Poll: Environmental Conservation and Daily Life].

20 See: The Prime Minister's Office, Gekkan Seron Cyosa "Shinrin Ringyo" [Public Opinion Poll: Forests and Forestry] (September 1996).

21 Brian Moeran and Lise Skov, "Japanese Advertising Nature: Ecology, Fashion, Women and Art", in Asian Perceptions of Nature: a Critical Approach, eds. Ole Bruun and Arne Kalland (Surry: Curzon Press, 1995), p. 235. Moeran and Skov show in "the nature cluster in Japanese advertising" that the words "nature", "ecology", and "health" belong to the same cluster.
22 See: The Prime Minister's Office, Gekkan Seron Cyosa "Shinrin Ringyo" [Public Opinion Poll: Forests and Forestry].
23 Satoshi Sugawara, Toi Hayashi Chikai Mori: Shinrin Kan no Hensen to Bunmei [How Close Are People to Forests? Civilisation and Changes in the Perceptions of Forests] (Tokyo: Aichi Syuppan, 1995), pp. 88-9.

24 See: The Prime Minister's Office, Gekkan Seron Cyosa "Shinrin Ringyo" [Public Opinion Poll: Forests and Forestry].
25 Satoshi Sugawara, Toi Hayashi Chikai Mori: Shinrin Kan no Hensen to Bunmei [How Close Are People to Forests? Civilisation and Changes in the Perceptions of Forests], pp. 111-2.
26 Takeshi Uemura, Mokuzai no Chishiki: Syohin no Ryutsu no Kaisetsu [Knowledge of Wood: Explanation of Products and Their Distribution] (Tokyo: Zaidanhojin keizai Cyosakai, 1996), pp. 374-6.
27 Toshio Hagino, Tokyo Mokuzai Shijo no Shiteki Kenkyu [A Historical Study of the Tokyo Wood Market] (Tokyo: Nippon Ringyo Chosakai, 1981), pp7-16. In the Edo period (1600-1868), for example, timber was transported by sea and by river, using the four rivers that lead to Edo (Kinu River, Tone River, Ara River, and Tama River). This shows that Edo (present-day Tokyo) was already a mass market whose wood consumption exceeded the regional supply.
28 Tokyo To, Tokyo Jutaku Hakusyo [Tokyo Dwelling White Paper] (2000), pp. 18-31.

29 Takeshi Uemura, Mokuzai no Chishiki: Syohin no Ryutsu no Kaisetsu [Knowledge of Wood: Explanation of Products and Their Distribution] (Tokyo: Zaidanhojin keizai Cyosakai, 1996), p. 372.
30 Hokkaido, Hokkaido Ringyo no Doko [Hokkaido Forestry Trends] (Hokkiado: Hokkaido Ringyo Fukyu Kyokai, 1996), pp. 102-3.
31 Hokkaido, Hokkaido no Rinsangyo [The Forestry Industry in Hokkaido] (1995), pp. 112-5.

32 Hokkaido, 21 Seiki wo Ninau Hokkaido no Shinrin [Forests in Hokkaido Towards the Twenty-First Century] (1996), pp. 6-11.
33 Hokkaido, 21 Seiki wo Ninau Hokkaido no Shinrin [Forests in Hokkaido Towards the Twenty-First Century], p. 21. About 8.5 million m^3 in 2005 and more than 10 million m3 of Ezo spruce and todo fir production can be expected by continuous afforestation.
34 Kozo Tawara, Hokkaido no Shizen Hogo: Sono Rekishi to Shiso [Nature Conservation in Hokkaido: History and Philosophy] (Hokkaido: Hokkaido Daigaku Tosho Kankokai, 1990), pp. 189-94, and Hokkaido, Hokaido Ringyo Tokei [Hokkaido Forestry Statistics] (1995). Although revised since this time, the Forest Reserves Law still holds.

35 Kozo Tawara, Hokkaido no Shizen Hogo: Sono Rekishi to Shiso [Nature Conservation in Hokkaido: History and Philosophy], pp. 249-50. The number of visitors increased from 3.8 million in 1965 to 17.5 million in 1975, and reached 44.1 million in 1985.

36 Kozo Tawara, Hokkaido no Shizen Hogo: Sono Rekishi to Shiso [Nature Conservation in Hokkaido: History and Philosophy], pp. 248-83.

37 See: Kenko Yoshida, Essays in Idlness: the Tsurezuregusa of Kenko, trans. by Donald Keene (Tokyo: Charles Tuttle, 1981).

38 The Economic Planning Agency, Kokumin Seikatsu Hakusyo [Annual White Paper on Life in Japan] (1995), p. 374. Yet, since this figure includes the colder areas such as Hokkaido where air conditioning is not necessary and diffusion is quite low, the percentage of homes with air conditioning in Tokyo would be much higher.

39 Fujio Adachi, Kita no Sumai to Machinami: Mohitotu no Sekatsu Kukan [Housing and Townscape of the North: A Different Kind of Living Environment] (Hokkaido: Hokkaido Daigaku Tosyo Kankokai, 1990), pp. 81-94.

40 Fujio Adachi, Kita no Sumai to Machinami: Mohitotu no Sekatsu Kukan [Housing and Townscape of the North: A Different Kind of Living Environment], pp. 81-94.

41 Hokkaidoritsu Kanchi Jutaku Toshi Kenkyujo, Kenkyu Hokoku No. 69: Sho Energy 100 Nen Jutaku ni Kansuru Kenkyu [Research Report No. 69: Study of Energy-Conserving 100-Year Houses in Cold Regions] (1997), p. 11.

42 Hokkaido, Domin Sekatsu Hakusyo: Domin Sekatsu no Sengo 50 Nen [Annual White Paper on Life in Hokkaido] (1995), pp. 59-60.

43 Hokkaido, Domin Sekatsu Hakusyo: Domin Sekatsu no Sengo 50 Nen [Annual White Paper on Life in Hokkaido], pp. 75-6.

44 The Architectural Institute of Japan, Lifecycle CO_2 de Tatemono wo Hakaru: Tatatemo no Kankyo Fuka Hyoka no Tebiki [Measuring Building by Lifecycle CO_2] (1997), p. 3.

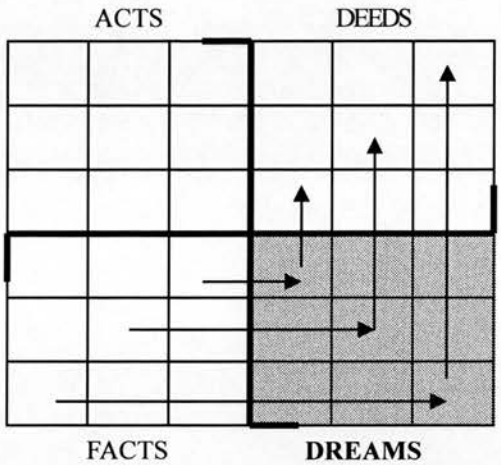
45 See: housing companies' brochures and advertisements.

46 Brian Moeran and Lise Skov, "Japanese Advertising Nature: Ecology, Fashion, Women and Art," in Asian Perceptions of Nature: a Critical Approach, eds. Ole Bruun and Arne Kalland, pp. 220-6.

CHAPTER 5:

Negative "Dreams":

The Causes of Scrap and Build in Tokyo and Imported Wood in Hokkaido



This chapter investigates the mechanism of how an individual's perception influences practical decision-making in housing design. As the previous chapter showed, each scrap and build in Tokyo and imported wood in Hokkaido is generated by two influences that dominate the individual's perception of environmental issues and housing: the domination of virtual images created by the media and the pursuit of freedom through technological development. This dual structure mirrors the condition of the self as the subject for making decisions about housing design, particularly about the place where it is built.

The anthropologist Nancy R. Rosenberger points out the significance of the self to the Japanese, and its place in the kind of duality mentioned above. The model that she proposes is described as sets of words denoting opposite poles of dimensions, such as outer/inner ("soto/uchi" in Japanese), front/back ("omote/ura" in Japanese) or on-stage (public) meaning/off-stage (private) meaning ("tatemae/honne" in Japanese). She defines each of the two categories as follows:

> "Contexts are more outer (soto) if they are organised according to rules agreed upon by the group and if social hierarchy is emphasised. These are more public situations in which people affirm the formal or stage meaning of their groups, often in relation to other groups...

> Contexts are more inner (uchi) if they are organised to encourage emotionally expressed harmony and intimate relations. Here people affirm their informal, backstage relations with others, forming an inner group of people. These people share relaxation and (as intimacy increases) inner feelings or emotions."[1]

Based on these dimensions, Rosenberger metaphorically describes the Japanese self as forming two categories: the tree "in summer" and the tree "in winter".

> "In outer contexts, hierarchical and disciplined, people are bound much like the tree in summer in an outer show of authoritatively bound diversity. The very differentiation of form and function in hierarchy binds people into complementary relationships of authority and productivity. This is the order with which groups face the outer world...
> In contrast, in inner contexts (uchi) of spontaneity and intimacy, people are loosely bound much like the tree in winter - in an inner-oriented nest that penetrates people's hearts, centralising them as a group into intangible unity."[2]

In the Notation of Life, the development of the self corresponds to "Facts" that consist of the individual's various perceptions. This is followed by the next stage of "Dreams" that consists of the two factors "poesy" in "folk-PLACE". "Poesy" in "folk-PLACE" describes the condition of the living place. Scrap and build in Tokyo in pursuit of more comfortable housing would be disputed by "poesy", extending the argument from climatic factors to urbanism, that is, the current physical and social environment surrounding the housing. Also, "design" in the work-PLACE" describes the condition of the working places in relationship with housing construction. Imported wood in Hokkaido and the concomitant decline in regional forestry-related industries can be investigated in terms of "design", which in turn would reveal the serious socio-economic environment that regional industries are currently facing. This relationship between environmental factors and practical decision-making for housing in each region could be interpreted as a manifestation of the self that cannot be observed in itself, and as the condition of the self in the processes of current housing design. This condition, however, does not always lead towards a sustainable housing design, but could result in destroying the balance between nature and human beings, revealing a negative aspect of "poesy" and "design" in "Dreams".

5.1 "Scrap and build": Tokyo

Although the individual's decision-making process is continually exposed to media pressure, individuals do not choose high insulation and airtight technology simply because of information they receive. Their decisions are motivated by practical needs associated with the real living environment they inhabit. In Tokyo, two factors characterise the living environment. One is the climate, which has already been discussed in the previous chapter. The other factor is the high population density caused by high land costs. Dealing with the reality of a high population density has diverted attention away from the original purpose of high insulation and airtight technology, which is to say energy efficiency. Managing the population density has even shifted the meaning of high insulation and airtight technology away from the media-created images of "economy", "comfort" and "health".[3]

5.1.1 Technology and urbanism

For the last thirty years, CO_2 emission in Tokyo has been increasing with the rising population and labour force. In a 25 year period, the emission from Tokyo has increased 1.5 times, and in 1993 it was 5% of the total of Japan. The increase in emission is caused by three factors: transportation, dwelling operation and office operation. In 1996, these three categories accounted for nearly 90% of the total CO_2 emission, with transportation responsible for 36.8%, offices for 32.4%, and dwellings for 20.0%. This distribution, with offices and dwellings sharing more than half of the total, is typical for an urban area.[4]

In response to this situation, the Tokyo regional governemnt's environmental policy aims to raise public awareness of ecological issues, and proposes a technological response to the problem of emissions. Faced with these higher CO_2 emission levels, and in keeping with the UN Framework Convention on Climate Change in 1993, the Tokyo local government started to plan the prevention of global warming in 1995, the starting point for the official response to global environmental issues. The resulting "Tokyo Environmental Basic Plan" was issued in March 1997, and was concerned with environmental issues including global ones. The plan set the following three objectives:

1. Health and safety,
2. Harmony between city and nature, and
3. Promotion of protection of the global environmental.

The campaign to promote the plan was called "Eco-ship Tokyo", a contraction of "ecological partnership", and emphasised the responsibilities of citizens, industry, economic leaders and policy-makers. The diffusion of energy efficient technologies was proposed to reduce energy consumption of "dwellings". In order to improve the global environmental situation, the government issued the "Tokyo Action Plan" in December 1997 aimed at creating a "recycling society". Housing design in this plan was covered by various technological applications such as high insulation and airtight technology, solar energy generation and passive solar design. In the report titled "Tokyo Action Plan" published by Tokyo local government in 1998, the argument was made that there was a direct, causal relationship between quotidian life and the global environment. Based on this premise, the plan recommended the application of technological solutions to reduce CO_2 emission from housing. Although this government recommendation did not include any physical targets, the proposed technological directive encouraged individuals to pursue ever higher standards of living, leading to scrap and build.[5]

This series of policy proposals tried to shift the current unsustainable economic conditions towards ecological production and consumption while ensuring both economic and sociopolitical sustainability. The resulting compromises with ecological sustainability are sought by means of technological developments. Through the building's lifespan, all activities are considered in light of technological developments, and the objectives for reducing emissions are established by installing the appropriate technology. However, as far as the large amount of industrial waste from building destruction is concerned, the condition remains unchanged within the once-through system. The individuals, who continue to scrap and build on a large scale, are not required to reduce overall construction.

The government's approach to reducing CO_2 emission, by the application of technology in housing, cannot always be a primary consideration for Tokyo residents. More practical matters would be the main concerns for many individuals. When the urban areas of the two regions: Tokyo's 23 Ku (wards) and Sapporo are contrasted, the differences between the respective areas of detached housing are obvious. Tokyo's 23 Ku, as the core area of the capital city, has a large population. Currently, 7.9 million are living in an area of 621 km^2, and the population density in 1996 was 12,700 people/km^2. By comparison, the population of Sapporo is 1.8 million and the area is 1,121 km^2. The population density was only 1600 people/km^2 in Sapporo in 1996, nearly one eighth of that of Tokyo. It is clear

from these figures that detached housing in Tokyo is much more physically restricted.[6]

Due to the rise of land prices in central Tokyo, the land area per house has been decreasing, but the building coverage ratio and the floor area ratio have increased. For example, the average land price per square metre in Tokyo's 23 Ku is 461 thousand yen, which is 40% higher than the 329 thousand yen in the broader Tokyo prefecture. Also, the average mortgage payment in Tokyo is 142 thousand yen per month, that is, 56% higher than the 91 thousand yen national average.[7] Table 1 shows the comparison of basic data for the average of Tokyo's 23 Ku and the three Ku of the 23 with the highest percentage are of low-rise: Nerima Ku, Suginami Ku and Setagaya Ku. The table shows that the average building coverage ratio is around 40%, and that of the floor area ratio is about 100% in each of the three Ku. According to these figures, the average house is supposed to be two-storeys. In accordance with the regulations, the maximum building coverage ratio in low-rise housing areas is 40 to 60%, with 80 to 100% for the floor area ratio. This means that the land use in the low-rise housing area in central Tokyo is moving towards full capacity.

	Average land area	Percentage of detached housing	Building coverage ratio	Floor area ratio	Average storeys
Tokyo's 23 Ku	203.1 ㎡	22.8 %	47 %	136.3 %	2.9 storeys
Nerima Ku	203.8 ㎡	44 %	39.8 %	90 %	2.3 storeys
Suginami Ku	210.7 ㎡	40.7 %	43.6 %	100.2 %	2.3 storeys
Setagaya Ku	234.4 ㎡	40.5 %	40.8 %	97.6 %	2.4 storeys

Table 1: Average housing conditions

Source: Tokyo To, Tokyo To Tokei Nenkan [Statistics of Tokyo] (1996), pp. 10-1.

Also, the low-rise housing areas have the strictest construction regulations: under ten metres of building height, with the building set back from both boundary lines and roads as shown in Figure 1. These conditions show that housing design seems to be determined by the size and form of the land where a house is built.

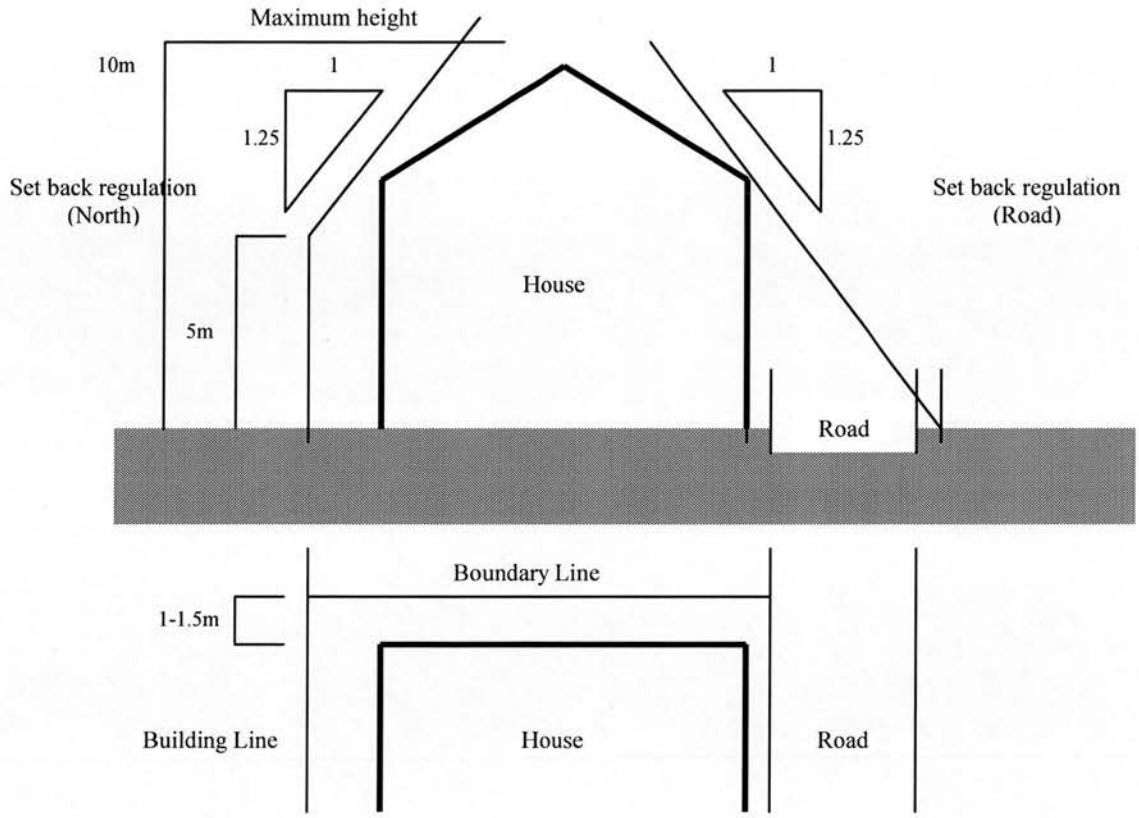


Figure 1: Regulations of the row-rise housing area

When these regulations are applied to the physical conditions that currently exist in central Tokyo described as the fundamental data in Table 1, there are four possible site planning patterns as shown in Figure 2. These patterns are based on a square site of 200m^2 with housing that has a building coverage ratio of 50%, and with a floor coverage ratio of 100%. They also conform to basic characteristics of traditional Japanese housing in that they are open to the east and the south to maximise exposure to direct sunlight in winter. Also, the north and west sides of the houses are walled to prevent the cold from the north in winter and uncomfortable sunlight from the low sun on summer afternoons. Although the open space to the east and south sides of the house is secure, there are narrow spaces around each of the four layouts. In the current detached housing in central Tokyo, the equilibrium established between man and nature by means of traditional architecture and its physical characteristic of openness is no longer sought. The narrow open spaces do not effectively reduce the indoor

temperature by natural ventilation. The Japanese architect Tadao Ando observed that the possibility of having traditional architecture in high-density areas is restricted:

> "Overly dense urban and suburban populations made it impossible to preserve a feature that was formally most characteristic of Japanese residential architecture: intimate connection with nature and openness to the natural world."[8]

In contrast to the physical conditions suggested by the available statistics, Figure 3 shows the actual housing maps of low-rise housing areas in Nerima, Suginami, and Setagaya Ku. In reality, there is a much higher housing density than the statistics show, with very little open space between the houses. The high housing density makes it more difficult to optimise the advantages of the traditional Japanese housing style.

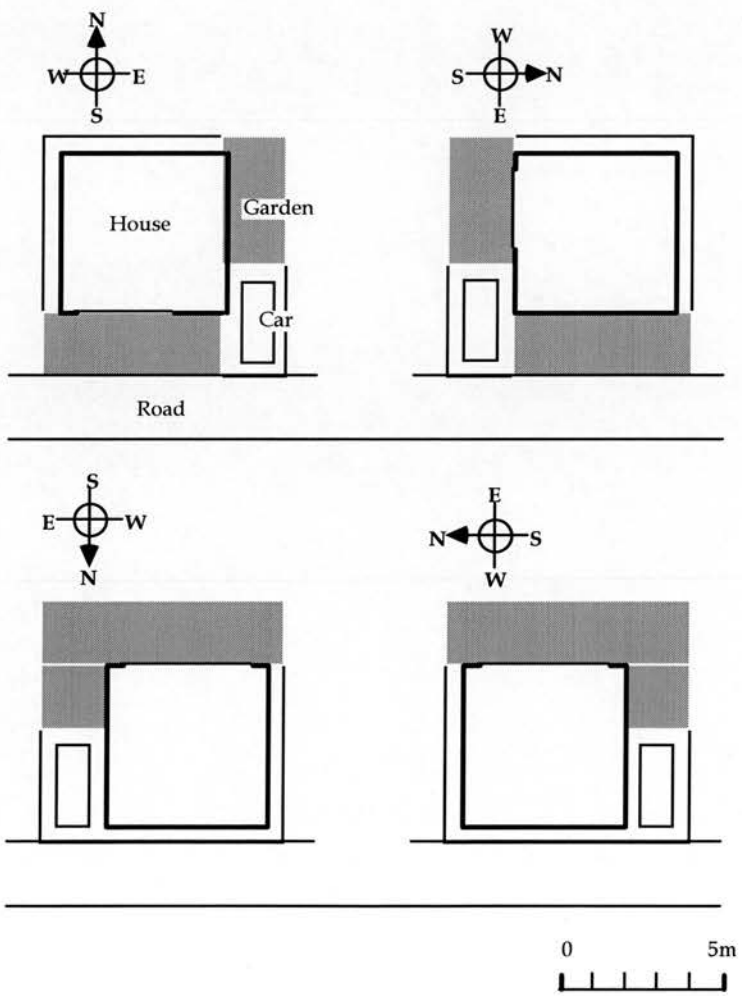
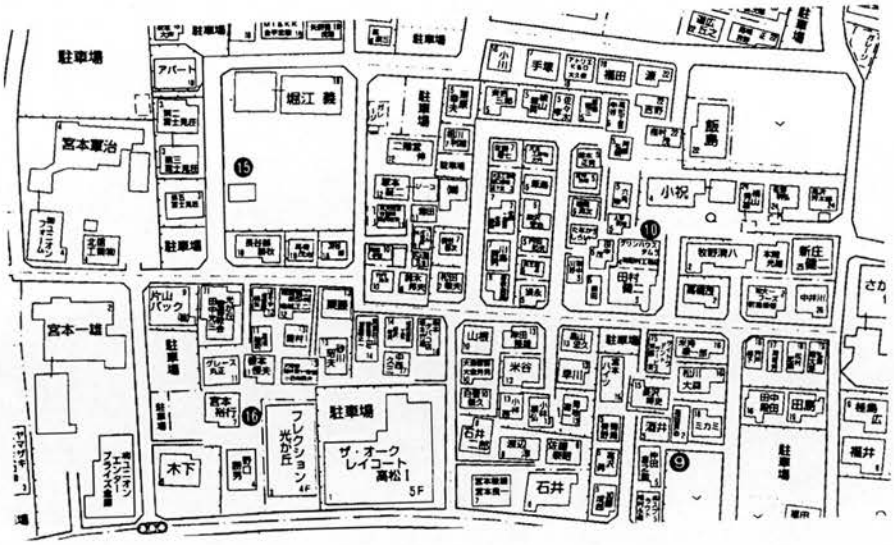
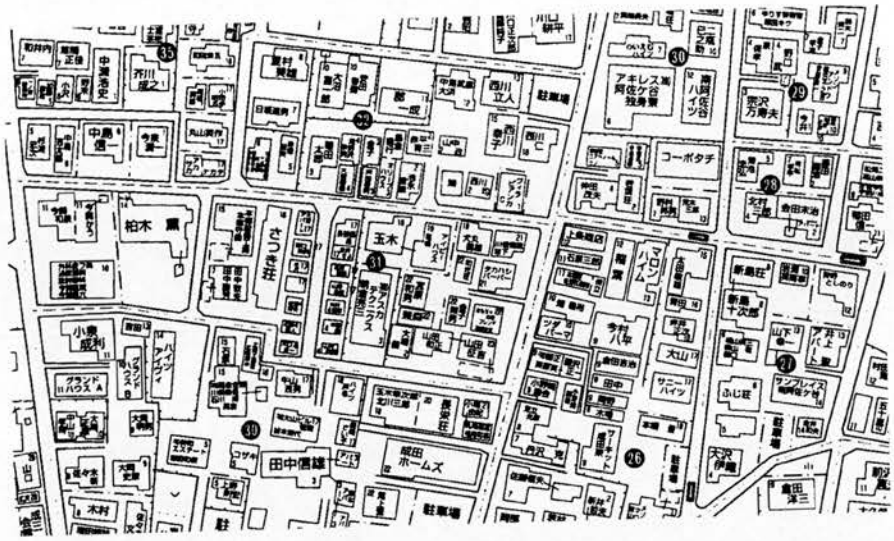


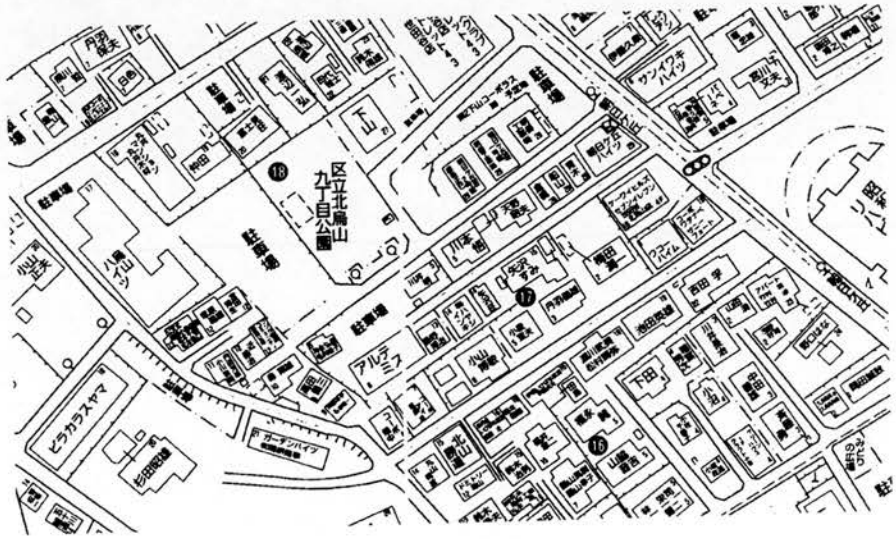
Figure 2: Design patterns for average site conditions (Tokyo's 23 Ku)



Nerima Ku



Suginami Ku



Setagaya Ku

Figure 3: Housing maps of the low-rise housing areas (1:2000) (Nerima, Suginami, Setagaya Ku)

The restriction of the physical environment in the urbanism process has resulted in greater use of technological developments such as electric air conditioning systems, high insulation and airtight technology. These technologies have, in turn, been contributing to creating an artificial indoor environment, which has separated housing from outer environmental influences. They enable housing to exist without actively engaging with the man-nature equilibrium.[9] Although this direction is preferable for the residents, it is having some negative effects on the overall environment in the area. With high levels of waste heat from building cooling systems, very dense cities suffer from the phenomenon of zones of higher temperature or "heat islands". In Tokyo, this phenomenon is observed throughout the year, creating a heat island in the central area.[10] Also, in the high-density residential areas, the use of air conditioning systems increases levels of domestic waste heat, which in turn reduces the cooling efficiency of the systems, accelerating energy consumption. The reduced cooling efficiency can be solved by installing more efficient systems.

The negative influences of high population density is not limited to the physical environment. They are spreading to a social aspect of residential areas. The isolated indoor space resulting from the individual's desire to create a technologically perfect living environment tends to generate apathy and indifference towards the outer world. In recent years, noise has become a serious source of environmental pollution in residential areas. A public opinion poll conducted in October 1996 showed that the number of complaints about noise from construction and neighbours to the police was higher in urban areas than the national average. But these numbers only represent those residents who complained about the noise pollution actively. The government's report on noise in the residential areas of Tokyo in 1990 revealed that the actual number of people affected by noise pollution was three fifths of those who answered the questionnaire. The sources of noise were "car and motor cycle" which was the highest percentage, followed by "pets", "crying babies and chatting" and "noise from air conditioning systems". Also, more than 60% of Japanese think that noise pollution will increase in the future.[11]

Although most of this noise is caused by neighbours, those affected have no traditional community context in which to counter it. Traditionally in urban areas, a strong sense of community developed among the residents who co-operated with each other in daily life. Various issues in the traditional community could be solved by its members discussing them. But because today's noise polluters and

sufferers do not know each other, they can no longer rely on this method to resolve their differences. Also, complaints to the police or to the local council simply make the relationship between neighbours worse. As a result, people tend to rely on noise polluters' "voluntary co-operation based on their sense of morality" or on "technological developments" such as the invention of less noisy products.[12]

Paradoxically, answers to these urban problems that often derive from technological developments are sought in technology itself. Less noisy products, such as quieter air conditioning systems and cars, are seen as one solution. Similarly, high insulation and airtight technology can create a perfect indoor environment together with air conditioning systems, offering the prospect of individual serenity in dense residential areas. Such technocentrism is accelerating a deep indifference to the real physical and social environment.

The environmental degradation of urban areas, which has been discussed here, emphasises the contradiction between it and the pursuit of higher standards of living. The size of current housing, which extends the floor area towards the maximum, has been encouraged by the government's policies, because the evaluation of housing has focused on physical characteristics. However, the size of housing has raised physical and social issues about residential environments. High insulation and airtight technology allow high density housing, but are counter-productive ways of resolving these problems. These two characteristics of housing, namely the size and closeness, are manifestations of the current condition of the self.

It might be argued that high insulation and airtight technology are required in residential areas to secure a basic human need for shelter that protects individuals from the influences of increasing environmental degradation. However, the principle that "technology satisfies a basic human need" cannot be applied here because the technology only solves the residential environmental problems superficially. The very causes of these environmental issues are the individual's pursuit of higher standards of living that, in turn, promote a sense of indifference towards the environment.

The concept of "autonomy" is defined as one of the basic human needs and consists of both freedom and responsibility. [13] When autonomy is applied to the residential housing situation, individuals' greater sense of responsibility for their living environment should go together with their pursuit of freedom. Yet the negative individual attitude mentioned above is only ego-realisation — the exclusive pursuit of their desires. The technological applications allow them to dominate their

internal housing environment without concern for their neighbours. Consequently, a sense of responsibility for the living environment is no longer required.

Moreover, the individuals' technology-oriented decision-making in housing is not made only by themselves, but seems to be influenced by the media. The perception of residential areas is influenced in favour of the application of the technology through three broad images: "economy", "comfort", and "health".[14] In other words, the abstract images of technology provide possible solutions for practical issues. Psychological aspects of the sense of safety and peace are a also significant factor in the individual's decision-making. Increases in crime and alienation of individuals in urban society are caused by a declining sense of community and neighbourhood. Being closed helps to satisfy the need for protection from unpredictable social factors, creating a buffer between the individual space and the outer space by means of technology. This represents a symbolic boundary between the individual's desires and their apathy towards society.

Global environmental issues have come to be seen as problems with technological solutions and thus, the importance of reducing CO_2 has become a matter of economic efficiency. As a result, the size (a manifestation of an individual's desires) and closeness (resulting from the belief in technological developments) of housing has led to cocooned dwellings with seemingly perfect, but artificial, indoor realms of safety, peace and quiet. Scrap and build will continue to be pursued in this endless quest for the perfect indoor environment.

5.2 Imported wood: Hokkaido

The result of importing wood into Hokkaido can be observed from two different points of view. One is from the perspective of sustaining regional industries and economies, and creating job opportunities. The other point of view is its impact on the global environment. Although importing wood into Hokkaido has contributed to regional industrial and economic sustainability, it has been affecting the environment. In this chapter, the regional distribution of wood will be examined, and the relationship between the pursuit of regional economic development and increasing environmental issues will be investigated.

5.2.1 Emerging issue of wood distribution

CO_2 emissions from Hokkaido are increasing. Compared to the 19,575 thousand tC in 1990, CO_2 emissions in 1997 had reached 21,363 thousand tC, and are expected to increase in the future. When the 1997 emissions were broken down by category, "industry" had the highest share with 36.6%, followed by 29.4% for "dwellings and offices", and "transportation" at 21.7%.[15] This shows that in spite of Hokkaido's lower population density, the impact of emissions from dwellings and offices is large.

The global environmental policy of Hokkaido was framed in response to Agenda 21 of the Earth Summit.[16] The government established the "Local Agenda 21 Hokkaido" in 1996 as a first step to tackling global environmental issues. In 2000, a "Plan for Preventing Global Warming" was published, in which more practical directions were given to government bodies, companies and individuals to reduce greenhouse gas emissions. However, these reports do not mention the relationship between increasing imported wood and environmental degradation at the global scale, limiting their arguments to emissions from Hokkaido.

When CO_2 emission from wood production is analysed, the main problem is caused by transportation rather than the production itself, because the processing actually emits less CO_2. In Hokkaido, transportation of wood is divided largely into two routes: by ship for importing wood and by lorry for transportation within Hokkaido. Each of the routes, however, does not correspond simply to imported wood and domestic wood. As Figure 4 shows, imported wood is not brought directly to the Sapporo-Otaru Area — the main consumption area. Instead, it lands in the ports near the major domestic production areas such as the Ports of Rumoi, Abashiri and Kushiro. Since the wood is imported as logs, it is landed near the processing factories and is transported to the central area, increasing the transportation distance as a consequence. Currently, both imported and domestic woods are distributed to the Sapporo-Otaru Area and to the other areas without clear distinction. This means that consumers in Hokkaido no longer have a firmly held idea of domestic wood or have a particular demand for it.

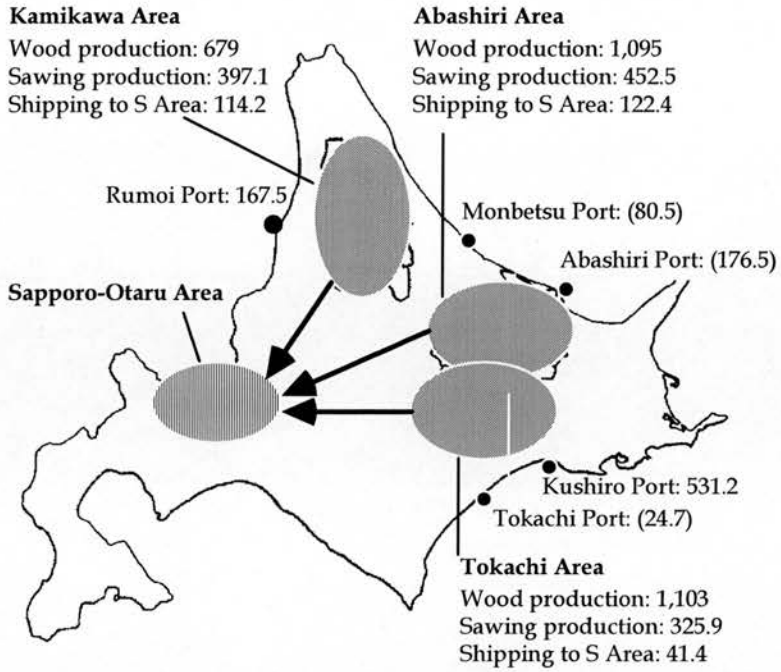


Figure 4: Wood production, Imported amount, Sawing production: 1995 data

Shipping amount to Sapporo-Otaru Area: 1993 data

Of the three wood-producing areas mentioned above, the Abashiri area has been chosen as an example for calculating the impact of wood transportation on the global environment. To contrast different wood transportation routes and amounts of CO_2 emitted, two production places, Tsubetsu as one of the major production towns in the Abashiri area and North America as one of the major exporting places, have been chosen. Also, two consumption areas have been selected: Sapporo as the main consumption area in Hokkaido, and Kitami as the centre of regional consumption in the Abashiri area.

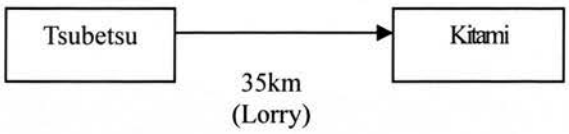
Using the designated locations above, the possible routes for supplying wood to the two consumption areas from the two production areas are summarised as follows:

1. Example 1: Supply to Kitami

There are two principal supply routes:

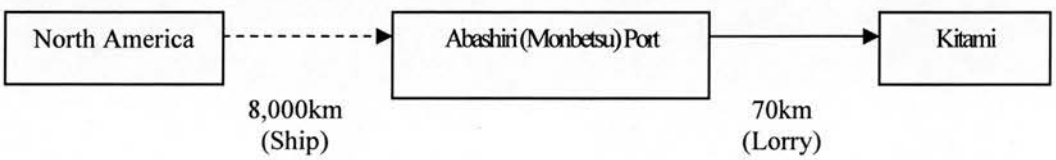
Route 1 (Domestic wood):

In the case of the regional material supply, the transportation route starts from the forests of Tsubetsu, followed by processing in the factories of Tsubetsu and is transported to Kitami.



Route 2 (Imported wood):

When imported wood is used in the area, the route starts in the production place in North America. The wood is shipped to Japan, processed in Abashiri area and supplied to the city.

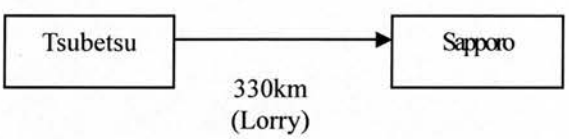


2. Example 2: Supply to Sapporo

There are three principal routes of supply:

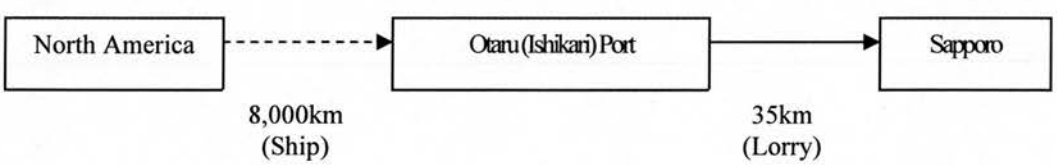
Route 1 (Domestic wood):

In the case of domestic wood, wood is produced and processed in Tsubetsu, and transported to Sapporo by lorry.



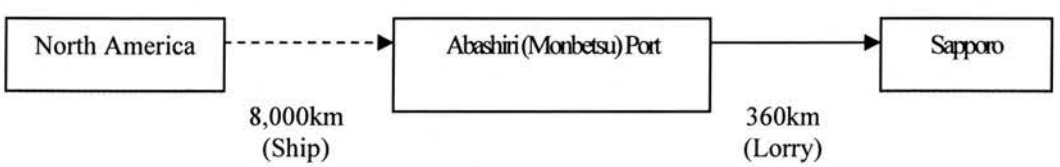
Route 2 (Imported wood):

When imported wood is shipped to Otaru (Ishikari) Port, it is processed at the factories near the port, and transported to Sapporo by lorry.



Route 3 (Imported wood):

When imported wood landed at Abashiri (Monbetsu) Port is transported to Sapporo, the distance by lorry increases by 360km.



Using the sawing wood supply routes to Kitami and Sapporo, CO_2 emissions from transportation can be determined and are summarised in Table 2. In the case of Kitami, the use of imported wood increases the energy consumption by 45 times more than the domestic supply. In the case of Sapporo, despite the long transportation of domestic wood from Tsubetsu, CO_2 emissions are still considerably less than a quarter of those for imported wood. It is worth noting that when the material is processed in the Abashiri area before it is supplied to the Sapporo area, the emission is 20% more than when it is processed near Otaru (Ishikari) Port, and nearly six times as much as that from the domestic supply.

km

tC/t

		Ship	Lorry	Total	Ratio
	Tsubetsu		2.5 0.0001	2.5 0.0001	–
Route 1	Tsubetsu-Kitami		35 0.0019	35 0.0019	1
Route 2	N. America-Abashiri-Kitami	8,000 0.0824	70 0.0037	8,070 0.0861	45.3

Wood supply within Tsubetsu and to Kitami (Example 1)

km

tC/t

		Ship	Lorry	Total	Ratio
Route 1	Tsubetsu-Sapporo		330 0.0176	330 0.0176	1
Route 2	N. America-Otaru-Sapporo	8,000 0.0824	35 0.0019	8,035 0.0843	4.8
Route 3	N. America-Abashiri-Sapporo	8,000 0.0824	360 0.0192	8,360 0.1016	5.8

Wood supply to Sapporo (Example 2)

*Each CO_2 emission by ship and lorry transported per km is as follows:

Ship: 1.03 • 10-5 (tC/t•km)
Lorry: 5.33 • 10-5 (tC/t•km)

Table 2: Energy consumption for the transportation of wood

The increase in imported wood in the major wood producing areas of Hokkaido has provided a way of economically sustaining the decreasing wood processing industry. Originally, the forestry towns developed because of the regional availability of natural resources required by industry. But the reduction in the domestic resource supply and the increase in imported wood has been threatening regional industries and economies. In order to sustain them economically, the existing industries have been processing imported wood, continuing the forest industries without relying completely on the regional supply. In other words, forests are no longer a significant resource for regional industries. Instead, the existing wood processing industry has been replacing their supply with alternatives to remain economically viable. To function properly, the wood processors have to import wood, which has been causing the complicated wood transportation within Hokkaido, which has resulted in the increase of CO_2 emissions.

5.2.2 The regional industrial crisis

The Central Okhotsk area, which consists of the Abashiri area used in the above example, has been selected to analyse the current attitudes of individuals to the regional forestry industry and its relationship with the local society.[17] As shown in Figure 5, the Central Okhotsk area, is in the eastern part of Hokkaido, and is geographically separated from Sapporo and the capital area of Hokkaido. The Central Okhotsk area consists of one city and seven towns: Kitami is the regional commercial city of this area and the rest are forestry towns (sc. Bihoro, Tsubetsu, Tanno, Kun-neppu, Oketo, Rubeshibe, and Saroma). Tsubetsu, Oketo, and Rubeshibe are each more than 85% woodland, and are the main place for wood production there. The population of more than 110 thousand is concentrated in Kitami. This is far more than that in Bihoro with 25 thousand inhabitants. The populations of the other towns are even lower (see Table 3). Consequently, housing construction is concentrated in Kitami, and is significantly less in the other towns. This divides the Central Okhotsk area into two: one area for wood production at the upper end of the seven towns, and the other for the wood consumption at the lower end around Kitami.

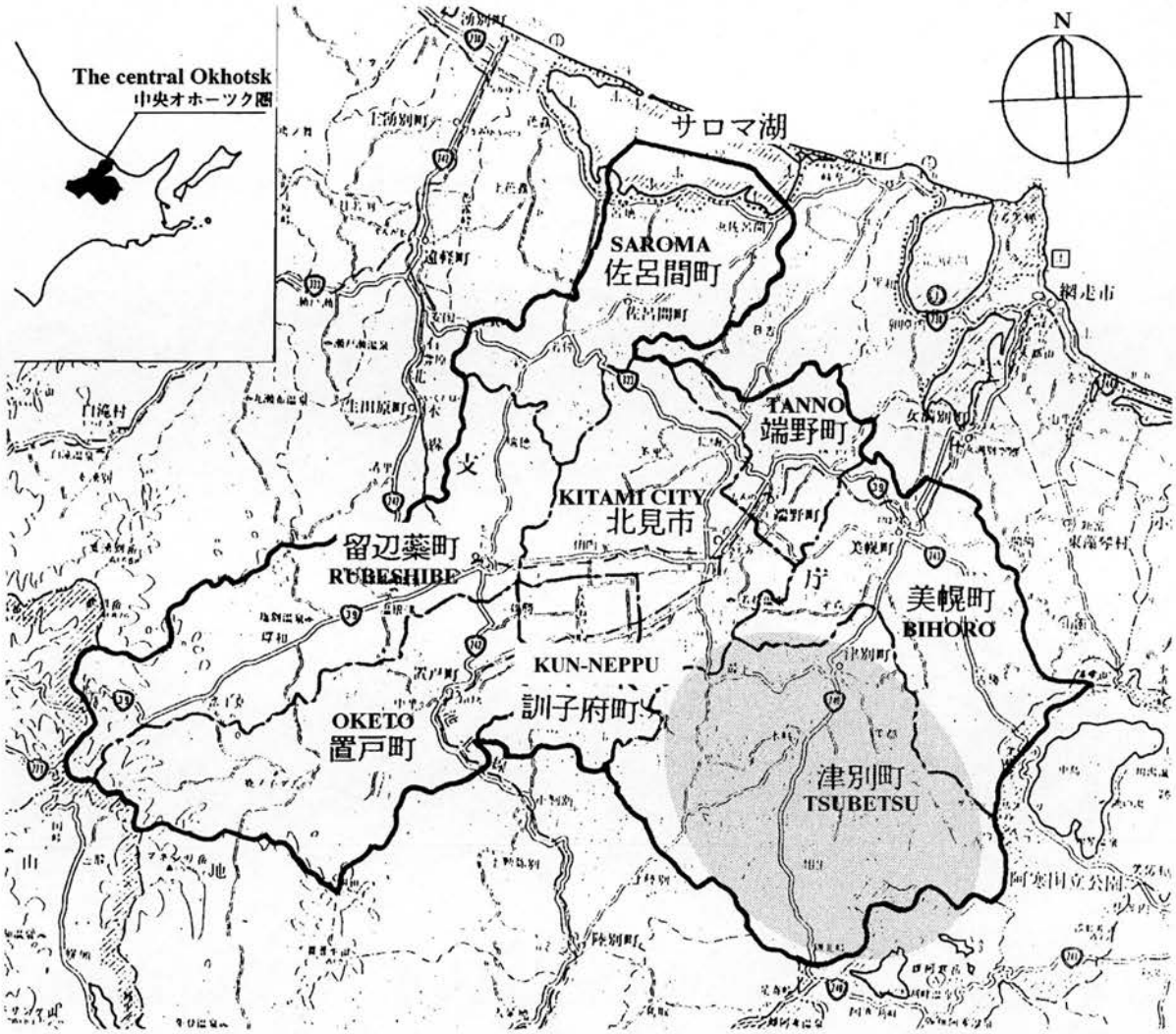


Figure 5: Map of Tsubetsu in the Central Okhotsk area

The large amount of wood required during the two world wars contributed to the industrial development of the Central Okhotsk area. This caused excessive felling of trees without taking into account the reproduction of the trees or reforestation. Just after World War II, the huge wood demands for housing all over Japan also accelerated the excessive felling.[18] Since the production was not developed based on a sustainable balance of ecology and industrial efficiency, the total wood stock in the area's woodlands has been decreasing continuously. This trend has been damaging the regional industries gradually, and the region's society. For example, the percentage of the total woodland area in Tsubetsu has not changed since 1955 when records began. However, the wood stock was more than 10 million square metres in 1965 decreasing to 85% of that level by 1994. In inverse proportion, the percentage of artificial woodland has increased from only 15% in 1965 to 37% in 1995. This means that, although the woodland area has been stabilised by reforestation, larger sized trees in natural

forests were felled around the peak of production in the 1960s, and only immature artificial woodland increased. However, the younger, reforested woodland needs more maintenance, which cannot lead to economic profitability in the short term, making the forestry difficult to sustain economically. These physical and economic conditions also accelerate the depopulation of the towns with the decline of the forest industries, which in turn contributed to the proportion of imported wood into Hokkaido. The population in Tsubetsu was more than 15,000 around 1960 when wood production was at its peak. Since then, the population fell to 7,600 in 1995, which is to say about half that at its peak.[19]

	Area (km^2)	Population	Housing Constr'tion	Woodland area (ha) ('95)	Percentage of wooded area
Kitami	421.08	110,070	2,654	23,477	55.8
Bihoro	438.52	24,888	252	27,308	62.2
Tsubetsu	715.88	7,569	55	61,486	85.9
Tanno	163.50	5,285	94	8,067	49.3
Kun-neppu	190.89	6,844	59	9,457	49.5
Oketo	527.54	4,496	47	45,032	85.4
Rubeshibe	564.69	10,582	51	48,946	86.7
Saroma	404.99	7,450	52	22,738	56.1
Total	3,427.09	177,184	3,264	246,511	71.9

Table 3: Data for the Central Okhotsk area

Source: Hokkaido, Hokaido Ringyo Tokei [Hokkaido Forestry Statistics] (1995), Jutaku Tokei Centre, Dai 8 Kai Hokkaido Jutaku Nenkan [Hokkaido Housing Statistics] (1996).

Recently, the decline of the regional housing industry has become a serious issue all over Japan. Mass-produced housing and imported design and construction methods have been destroying the traditional housing culture and job opportunities. The Central Okhotsk area is no exception. Job opportunities in Kitami are changing as traditional house building techniques are replaced by industrialised housing methods. The town of Kitami is the main consumer of wood in the Central Okhotsk area. Figure 6 shows the share of wooden detached housing construction in Kitami in 1995. Of the 2007 houses constructed in Kitami, 1,573 (about 80%) were wooden.[20] This shows a higher

demand for wooden housing than the regional average of the wooden housing construction. Also, half of the wooden houses and 40% of the total housing construction were detached wooden housing.

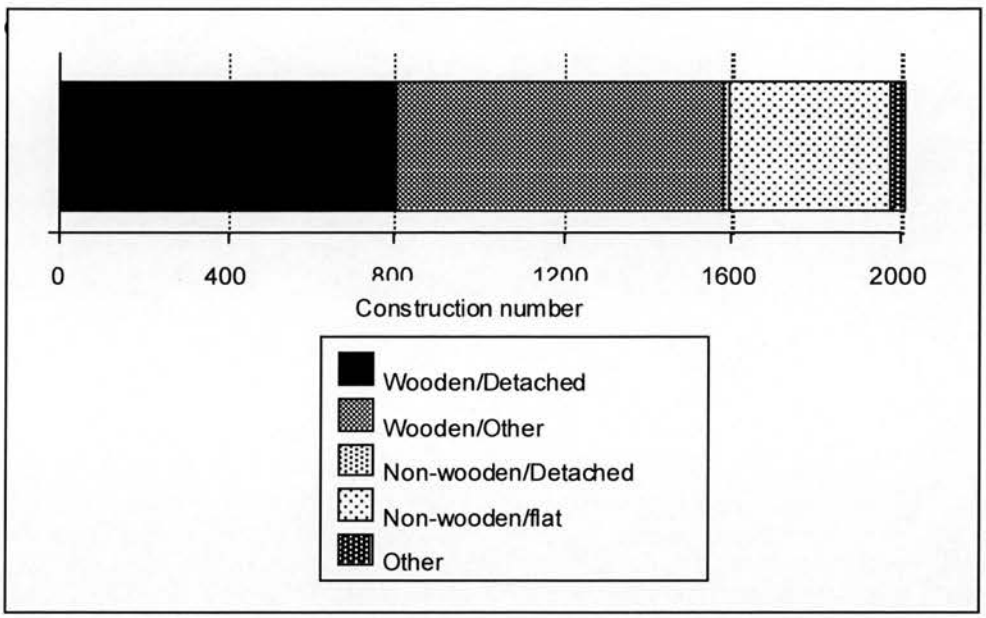


Figure 6: Annual housing construction in Kitami (1995)

Source: Jutaku Tokei Centre, Dai 8 Kai Hokkaido Jutaku Nenkan [Hokkaido Housing Statistics] (1996).

The construction types of detached wooden housing are divided largely into three: the conventional Japanese method of construction, the 2x4 structure imported from North America, and prefabricated housing designed and built by nation-wide housing companies. In Kitami, the proportion of 2x4 structures in the total wooden housing increased rapidly from 70 in 1990 to 324 in 1995 which was 20.6% of the total number constructed. Conversely, the share of conventional housing out of the total amount of wooden housing decreased to less than 75%.[21]

The decrease in conventional methods of housing does not have a direct relationship with ecological sustainability, but has significant implications for the economic sustainability of the regional housing industry. Since most of the wood used for 2x4 housing is imported, and is already cut overseas into 2 inch x 4 inch studs, it does not require further processing.[22] As the materials are factory-made, this type of housing requires fewer skilled workers to construct. This new construction method has won a significant market share, and is not compatible with the conventional methods and skills of local builders. In this way, a housing construction process which is alien to the conventional

regional process has been developed in the area.

It can be said that the current conditions of the forestry and housing industries in Kitami display a lack of regional consensus in their ecological and economic sustainabilities. Currently, the domination of economic sustainability has divided the conventional regional material flow from regionally produced wood towards consuming it for housing construction. The regional forest industry no longer produces enough wood to economically sustain the regional wood processing industry. As a result, the industry has to import wood in order to continue its activity. At the same time, increasing imported wood has brought a new housing construction method. The dominating cheaper material supplies for housing construction are contributing to the diffusion of 2x4 housing. This development threatens regional job opportunities for the traditional housing methods and timber industries. This situation shows the structural shift of the economy beyond the connection with the place, as dictated by global economic rules. The "place-WORK" relationship proposed by Geddes is no longer applicable to the forestry-related industries of Hokkaido.

5.2.3 Townscape planning and the regional industries in Tsubetsu

The decreasing awareness of forests as production places among consumers allows imported wood to dominate the regional economy. A possible approach for sustaining the regional industries, therefore, could be to heighten the communal and individual awareness of regional resources. In the Central Okhotsk area, wood, as the natural local resource, was the focus of regional planning initiatives. The "HOPE Project" was launched to develop the local culture and economy through council house design and the planning of residential areas. It started in 1983 and was promoted by the Ministry of Construction. The word "HOPE" is an acronym for "Housing with Proper Environment", and its aim is a sustainable regional housing policy for the future.[23] Its objectives are summarised in the following three points:

1. Maintenance of a high quality residential environment based on regional characteristics
2. Housing practices by local initiatives
3. Development of a housing policy directly related to the local housing culture and production systems [24]

In order to satisfy the needs for housing quality beyond the quantitative aspects rooted in the

demands of the post-war recovery, it is necessary to comprehend housing from the alternative viewpoints of "community", "lifestyle" and "culture". The unique regional characteristics with abundant natural resources contribute to synthesising these three directions through housing design and construction, which are echoed in the HOPE Project's motto: "housing planning integrated into the region".[25]

Generally, each HOPE project is planned and implemented by the city, town or village council. The project starts officially with the approval of the plan by the Minister of Construction. The project period is three years: planning it for the first year, followed by two years for its implementation. The project receives a subsidy for the one-year plan and financing for the construction from the Government Housing Loan Corporation of Japan. In the thirteen years following the launch of the project in 1983, 295 cities, towns and villages all over Japan and 17 in Hokkaido were approved. In the practical stage, a "HOPE Project operation committee" (more simply the "HOPE committee") is established to operate the project smoothly and effectively. The committee consists of members from the city, town or village council, the prefectural government, the local housing industries and academic institutions, so that the local potential can be evaluated and optimised.

The Tsubetsu HOPE project started in 1991 as the first project in the Central Okhotsk area, and has been promoting regional housing design and landscape planning to develop its economy and industries. Although the project itself was located in Tsubetsu, it was conceived as a model for alternative forest industries for the whole Okhotsk area, strengthening the cycle from regional material supply to consumption.

First of all, the project plan proposed the notion of "Tsubetsu forest-friendly thinking", which consists of three basic ideas:

1. Better residential areas,
2. Regional production, and
3. Regional culture[26]

Based on these ideas, practical planning was developed including a number of public building and council housing construction projects. One of the major concerns of the whole scheme is the plan to create a unique townscape in harmony with the natural scenery. In the planning process, the town is

divided into two areas: "nature" and "town centre". The natural area consists of the forests and the agricultural fields, which cover most of the land. The town centre consists of residential and commercial places. The two areas are interconnected by "axes": the major roads and rivers that penetrate from the natural areas to the town centre. The scenery along the axes will contribute to creating an ecologically-friendly image of the town for people driving through it.

In the town centre, where housing and industrial facilities are concentrated, there is a spatial distinction between private and public according to ownership. Individuals have responsibility for the private spaces as the owners, and their social responsibilities are vested in the public spaces as members of the community. In this way, the townscape is created and maintained through the co-operation of the residents and the council.

The council summarised the townscape plan of the town centre's residential area in their "Housing Planning Manual". This guideline for site planning and housing design is one of the main outputs of the project. As already mentioned, the current housing in Hokkaido is not compatible with Japanese traditional housing, and has been influenced by the imported designs as well as individual aesthetic preferences. This causes desultory design. One of the major purposes of the "Housing Planning Manual" is to develop consensus in the regional housing design in order to create a unified townscape. Natural factors in Tsubetsu, such as snowfall and regional wood, are emphasised as reasons for converging the various design in a particular direction. For example, using regional wood on the façade is recommended to create a unified townscape and to represent visually the region's identity. Fences and garages in the regional wood are also design recommendations. The unified roof slope is determined by snowfall. The colour scheme harmonises with the wood. Unified housing height as well as energy efficient technologies such as high insulation and airtight technology is listed as recommended design characteristics.[27]

Despite attempts to rationally harmonise the design based on regional climatic factors, there is no process to reach a consensus among the individuals on what should be taken as the regional design elements. For example, the wooden façade is not favoured by all residents because it costs more and requires greater maintenance. Also, the unified roof design, which was determined by the preferred construction technique and by the materials for roofing is not suited to the builders' ways of construction or to the individual residents. Since individuals cannot find reasons to apply the

guidelines in designing their own housing, they cannot be accepted as part of the regional culture. The arbitrarily created elements by the members of the council are restricting the individual's decision-making in a particular direction to increase regional wood consumption and display the wooden façades. Socio-cultural factors from which housing design develops and stabilises are no longer sought in the design manual, and the design has become merely a unified collection of the available materials. An aesthetic aspect of the housing design represents an arrangement of preferable elements, and a technological aspect ensures a comfortable living environment with advanced technology. But art and science in one housing design still can remain separate without discovering a way of synthesising a regional culture.

This superficial approach to the residential area is revealed most clearly and directly in the design elements of the private spaces of the formal townscape. In the HOPE project, it is recommended that industrial activity be hidden from view. The forestry areas cannot be seen from the town or from the main roads, and are completely screened behind the naturally preserved landscape. In the town area, the wood processing factories and the wood stacking areas are also hidden behind planted trees and wooden structures. Instead, the recommendation is that wooden products made within the town be displayed along the roads, so that visitors can easily identify them. The image and identity of Tsubetsu created by emphasising the regional wooden products rather than the production processes, is proposed to highlight products that might lead to economic development.

Through the example of Tsubetsu's HOPE Project, the mechanism for developing the regional economy by pursuing regional economic profit using positive images of forests becomes evident. Wood, as an industrial product, contributes to the regional economic development and to urban regeneration. Forests with natural beauty provide a visual vocabulary of nature for the planned landscape. As a result, the artificial creation of positive images of forests and wooden products accelerates the consumption of wood resources and places greater reliance on imported wood. This, in turn, prevents both residents and visitors from appreciating the reality of the resource shortage and the environmental degradation of the less maintained forests.

This trend of revitalising regional industries is common all over Japan. Okpyo Moon, a Korean anthropologist claims that:

"... [in revitalising], species or landscapes of particular market potential have been identified and commodified in the name of nature."[28]

The landscape plan for Tsubetsu can also be seen as an example of "commodified nature", symbolised in the wooden products and the wooden façade of the housing. Tsubetsu's "forest-friendly thinking" is easily interpreted as an economic initiative rather than an ecological one. Moon continues:

"The tourism industry has been an important strategy of village revitalisation in Japan and "nature" has been extensively utilised towards this end along with other resources. In the process of its commodification, however, we can note that local views and attitudes to nature tend to be replaced by urban views and attitudes. The tourists are mostly urbanites and hence it has to be their language and understanding that the villagers adopt to attract them. So, for instance, they adopt the new language of environmentalism, but what in effect dominates the nature/human relationship now is capitalistic interests."[29]

Together with the HOPE project, Tsubetsu has been shifting from conventional forestry towards comprehensive industrial development including the tourism and leisure industries. The two languages in the landscape: the beauty of the forests and wooden products reveal themselves as metaphors for what the tourists look for in "nature". However, what goes on in the forests and felling sites contradicts the ecologists' value of nature. By concealing the felling sites from public view, the forestry industry is avoiding public debate and attacks from ecologists. In the context of Canadian forestry, Michael Hough has noted that:

"The response among foresters was the creation of visual buffers so that people would be protected from the unsightly scars on the landscape. Hiding clear-cut became required practice, and forestry manuals were written to insure that the results of logging would look neat and visually unobtrusive...
Their purpose was to protect the public form the visual impact of logging beyond the reserves. "Out of sight, out of mind," of course, is a motto that applies not only to forestry but to other land management issues."[30]

Tsubetsu townscape planning has revealed the idea of creating a huge showcase of wooden products. This visual image of the wood-producing place is artificially created in order to sustain the

regional industries. The housing design in Tsubetsu is going to be restricted by the domination of economic considerations. As a result, housing is divorced from the needs of residents, and regional culture is deprived of the opportunity of including housing design.

5.3 The negative manifestation of "Deeds" in Tokyo and Hokkaido

These two regional examples show that the perception of the reality in daily life does not always lead individuals to improving the current conditions. Instead, it can lead them to catastrophic results, damaging both the living and natural environments.

In Tokyo, the urban residents' attitude to the living environment not only develops through a sense of the living place (resulting in increased noise and crime), but also by the poor relationship between neighbours, leading to negative feelings towards them. The perception of neighbours no longer has the power to solve community problems. In the context of individual-centred lifestyles and values, it is impossible to develop a common morality within the community. While regulation threatens individual freedom, remote interactions with neighbours guarantee individual freedom without generating any sense of obligation to the community. The dilemma of the lack of morality and the pursuit of individual desires seems to characterise the current urban residents' consciousness. Using Rosenberger's metaphor introduced at the beginning of this chapter, the increasing amount of larger housing construction can be seen as the growing trees "in summer". In this case, the growing trees "in summer" are a metaphor of the individual's attitude to pursuing larger housing influenced by Japanese progressivism. On the other hand, the closeness of housing represents the pursuit of a safe and comfortable indoor environment, symbolised by an "inner-oriented nest" as with the tree "in winter". As the tree resists the severe climate, housing plays the role of protecting the individual's life not only from the natural environment but also from the negative influences of the outer world — the living environment.

In Hokkaido, Rosenberger's metaphor of the tree is reveals itself in a different way. Since forest preservation is promoted based on consensus between ecologists and economists, the regional landscape consists of both sustaining natural scenery and regional economic activities. The natural forests concealing the forestry and the increasing wooden products in Tsubetsu townscape encourages

the extension of the market of regional wooden products, represented as the growing tree "in summer". At the same time, this regional revitalisation contributes to securing job opportunities for the people living in the place. In an economic sense, wood secures the daily lives of workers and the community, bringing a sense of relief. This also shows an "inner-oriented nest" as the tree "in winter". However, this sense of relief is not always derived from sustaining regional wood production. It is also reinforced by importing wood. In other words, spiritual, social and economic sustainability in Tsubetsu can be sought without relying on regional ecosystems. The increasing reliance on exogenous resources is accelerating the indifference to nature in a practical sense, not only for visitors to Tsubetsu but also for the residents.

In terms of the Notation of Life, the individual's awareness of the living place as "folk-PLACE" in Tokyo has shown the negative manifestations within neighbourhoods, which can be categorised as an "achieved Polity and Life" in "Deeds". The self that brings itself to perceive the living environment shows the contrast between exploring the individual's desires and exclusively protecting the individual from the environment. In the latter case, the community fails to solve the real issues that each individual is facing in daily life. In Hokkaido, the economy-oriented attitude to the wood-related industrial place as "work-PLACE" leads to a commodification of the forest. It has resulted in the Tsubetsu landscape and townscape plan that is superficially a "achieved Synergy" of ecology and economy in "Deeds". The design strategy, as a way of compromising between ecological and economic concerns, has been determined by economic rules. Although it has contributed to improving both the regional natural environment and economic activities, it is merely exporting the issues abroad, concealing from individuals consciousness of wooden products. Each of the two negative manifestation of the Notation of Life in Tokyo and Hokkaido is shown in Figure 7.

Adopting Guattari's terminology, the current isolating environmental ecology and the domination of spiritual and social ecology can be reconstructed based on the traditional model of equilibrium between the three ecologies.[31] In the following two chapters, a positive reading of the Notation of Life in Tokyo and Hokkaido will be sought from their historical contexts. It shows an antidote to the current negative "Deeds" that has been shown in this chapter. Many of the current problems of authenticity and social coherence stem from two historical discontinuities: the Meiji Restoration and post-war reconstruction. Applying the Geddesian notion of an evolutionary process to these

discontinuities, an alternative direction for housing design in Tokyo and regional industries in Hokkaido will be sought in historical continuity that runs from premodern times to the present day.

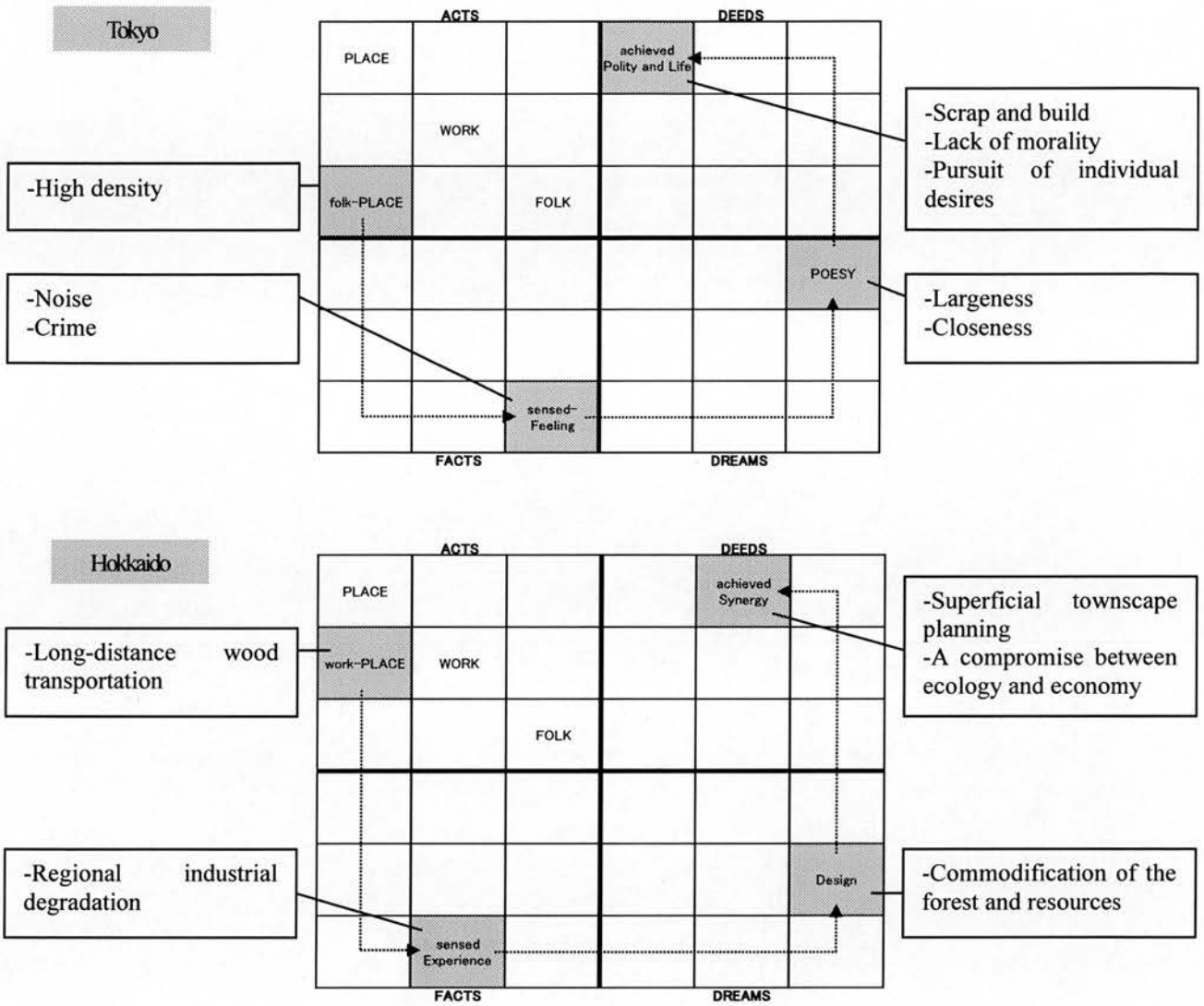


Figure 7: A negative manifestation of the Notation of Life (Tokyo and Hokkaido)

---

1 Nancy R. Rosenberger, "Tree in summer, tree in winter: movement of self in Japan", in Japanese sense of self, ed. Nancy R. Rosenberger (Cambridge: Cambridge University Press, 1992), p. 69.

2 Nancy R. Rosenberger, "Tree in summer, tree in winter: movement of self in Japan", in Japanese sense of self, ed. Nancy R. Rosenberger, pp. 73-4.

3 See: Chapter 4.

4 See: Tokyo To, Tokyo Jutaku Hakusyo [Tokyo Dwelling White Paper] (2000), p. 229.

5 See: Tokyo To, Tokyo To Kankyo Kihon Kekaku [Tokyo Environmental Basic Plan] (1997), p. 35, and —, Chikyu Kankyo Hozen Tokyo Action Plan [The Global Environment Preservation Action Plan] (1998).

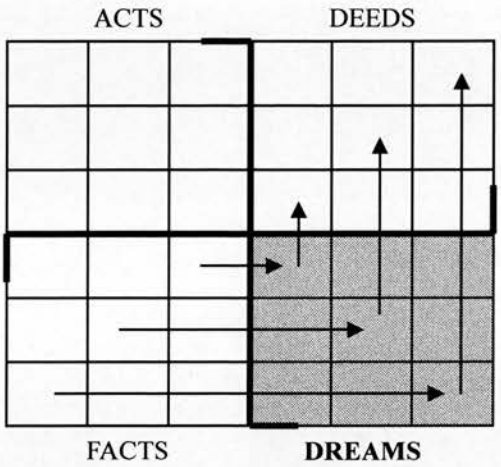
6 Sapporo Shi, Sapporo Tokeisho [Statistics of Sapporo] (1996), p. 31, and Tokyo To, Tokubetu Ku no Tokei [Statistics of the 23 Ku] (1995), p. 7

7 Tokyo To, Tokyo Jutaku Hakusyo [Tokyo Dwelling White Paper], p. 229. Also see: The Economic Planning Agency, Kokumin Seikatsu Hakusyo [Annual White Paper on Life in Japan] (1995), p. 437.
8 See Kenneth Frampton, "The Work of Tadao Ando", in GA: Tadao Ando (Tokyo: A.D.A. Edita, 1987), pp. 9-10.
9 See: Chapter 4.
10 Masashi Ito, Mitsuru Udagawa and Takehiko Mikami, "Tokyo Tonai no Kion Bunpu ni Tsuite (Sono 1)" [A Survey on the Distribution of Temperature in Tokyo (Vol. 1)], in Tokyo To Kankyo Kagaku Kenkyujo Nenpo (1994).
11 See: The Prime Minister's Office, Gekkan Seron Cyosa "Seikatsu Kankyo Seikatsu Gata Kogai" [Public Opinion Poll: Living Environment] (October 1996). More than half the residents in Tokyo's 23 Ku have experience of noise and vibration from construction and commercial buildings, a figure that is twice as high as in Sapporo.
12 Tokyo To, Sekatsu So-on Boshi no Tebiki: Oto ni Yasashiku Kurashi ni Yasuragi wo [Guideline for Preventing Noise from Dwellings] (1990).
13 See: Chapter 1.
14 See: Chapter 4.
15 Hokkaido, Hokkaido Chikyu Ondanka Boshi Keikaku [Plan for Preventing Global Warming] (2000).
16 See: Hokkaido, Hokkaido Chikyu Kankyo Hozen Kodo Shishin: Agenda 21 Hokkaido (1996).
17 Central Okhotsk is one of the three areas for the Forest-Side-Type City Project in Hokkaido. It is a part of the Okhotsk area administrative territory.
18 See: Hokkaido, 21 Seiki wo Ninau Hokkaido no Shinrin [Forests in Hokkaido Towards the Twenty-First Century] (1996).
19 For statistics on Tsubetsu, see Tsubetsu Cho, Tsubetsu Cho Tokeisyo [Tsubetsu Statistics] (1993).
20 Jutaku Tokei Centre, Dai 8 Kai Hokkaido Jutaku Nenkan [Hokkaido Housing Statistics] (1996).
21 See: Jutaku Tokei Centre, Dai 8 Kai Hokkaido Jutaku Nenkan [Hokkaido Housing Statistics].
22 Currently, there is only one factory producing 2x4 timber in Hokkaido.
23 Nippon Jutaku Kyokai, Chiiki Jutaku Hikkei [Regional Dwelling Handbook] (1995), p. 76.
24 HOPE Keikaku Suishin Kyogikai, 96 HOPE Keikaku [96 HOPE Project] (1996).
25 HOPE Keikaku Suishin Kyogikai, 96 HOPE Keikaku [96 HOPE Project], p. 4.
26 Tsubetsu Cho, Tsubetsu Shinrin Juku Plan [Tsubetsu Forest-Friendly Planning] (1992), p. 43.
27 Tsubetsu Cho, Tsubetsu Shinrin Juku Jutaku Seibi Manual [Tsubetsu Forest-Friendly Planning Housing Design Manual].
28 Okpyo Moon, "Making Nature in Rural Japan", in Japanese Images of Nature: Cultural Perspectives, eds. Pamela J. Asquith and Arne Kalland (Surrey: Curzon Press, 1997), pp. 225.
29 Okpyo Moon, "Making Nature in Rural Japan", in Japanese Images of Nature: Cultural Perspectives, eds. Pamela J. Asquith and Arne Kalland, pp. 232.
30 Michael Hough, Out of Place: Restoring Identity to the Regional Landscape (London: Yale University Press, 1990), pp. 129-31.
31 See: Chapter 1.

CHAPTER 6:

Towards a Reconstruction of "Dreams":

Tokyo



Tokyo was once called as "Edo", the shogunate's capital of Japan during the Edo period. From 1600 until 1868, Edo was one of the world's most populated cities. The population of around 7,000 in 1590 before the construction of the capital, had reached 500,000 by 1630 and a million by the beginning of the eighteenth century. [1] Despite the large population, Edo persisted physically, sociopolitically, and even spiritually for nearly 300 years.

James L. McClain, a historian, contrasts Japan with France in the early modern era, both of which were dominated by absolute rulers: the Tokugawa shogunate and the Bourbons kings. Each of the rulers developed the capital, Edo and Paris respectively. These two cities seemed to symbolise the absolutism of accumulation, not only of political power, but also goods and cultural activity. In the early seventeenth century, the Tokugawa shogunate started its Japanese reign by restructuring the whole of Japan in order to ensure its sociopolitical sustainability. Spatially, the shogunate situated the domains of "allied lords" around Edo by increasing military power in the area. Less trusted "outside lords" were situated far from Edo. Socially, the shogunate divided the society into four status groups: the samurai (warriors), the peasants, the artisans and the merchants, from top to bottom. This stratification was designed so that authoritarian power could be brought to bear as efficiently as

possible on the different status groups. This spatially and socially centralised structure was the foundation of the Tokugawa era.[2]

Another significant role of the government was to control the circulation of goods and food in order to economically sustain the newly developed sociopolitical structure. Economic sustainability also was important for the citizens to ensure a sense of peace and safety after a long period of civil wars. Since the premodern Tokugawa shogunate had an isolationist policy until 1868, any relationship with foreign countries, including imports and exports, were severely restricted. So that Edo could physically sustain the increasing population within the Japanese self-sufficient system, the city accumulated and consumed a huge amount of resources.[3] The role of the Tokugawa shogunate, therefore, was to control the limited resources efficiently so that they would be available to the different groups of people at reasonable prices. Edo, with its large population, developed into a place of consumption of centralised goods. This accumulation of power and goods in Edo can still be seen as the basis in the fundamental structure of modern day Tokyo.

This chapter examines the continuous and discontinuous factors that have shaped the capital from Edo to the present. The historical context reveals crucial characteristics of Edo: a sustainable city, and its problems that have continued to this day. Through a critique of the persisting policies from Edo to Tokyo, which have led to the current unsustainable condition of housing design, an alternative Japanese housing policy focusing on spiritual sustainability is sought. This will be a possible direction for sustainable housing design in Tokyo.

6.1 Political and economic continuity

6.1.1 Edo: the Eco-city

In the search for alternative directions for the current unsustainable Tokyo, Edo can be seen as a possible model of a sustainable city. The "Itabashi Eco-polis Centre" in Itabashi Ku, one of Tokyo's 23 Ku, is the central facility for environmental education and information. The centre shows that the traditional Edo culture, which was based on recycling can be a solution for current environmental issues.[4] A lot of the current Japanese literature on sustainable cities attributes the same characteristics to Edo as the "eco-city" — ecologically friendly city. It seems to portray Edo as the ideal vision for

present day Tokyo.[5] In fact, Edo can be said to have been a sustainable city. This seems to be the case not just physically, as a place of aspect recycling of materials. Noboru Haga, a Japanese historian, points out two aspects of recycling in Edo: the recycling of the "physical life" and that of the "spiritual life".[6] Physically sustainable systems can be summarised in the following three points: repair, re-use, and recycling. In Edo society, repair was established as a separate industry, and skilled workers repaired almost everything, extending the lifespan of material products to the maximum. Unwanted products were collected from citizens and sold in second-hand shops to contribute to their re-use. Products that could neither be repaired nor re-used, could be recycled through different processes and made into different kinds of products.[7] Disposal was a last resort. Even the waste passing through the disposal system in Edo was used. The "night soil" was an important fertiliser for the cropland around the city, which could satisfy the city's huge demand for food. When there was a shortage of animal waste, human waste from the urban area had an economic value rather than just being disposed. This matching of the urban need for sanitation and the rural need for fertiliser made it possible to sustain the recycling of physical life. The urban sanitation management, keeping waste out of the city, is contrasted with the environmental degradation of Paris in the same era. The combination in Edo of closed (sc. repair and re-use) and open (sc. recycling of resources and waste) circuit systems, contributed to the maximum use of limited materials. These points are often made in support of the argument that claims Edo as an eco-city.[8]

Recycling in the spiritual life followed the strict rules of handling disposal and of recycling daily waste governing the physical life. The citizens' awareness of physical recycling was not always derived from the regulations with which people had to comply. It was also based on their autonomous understanding of the recycling process, by which individual life was spiritually sustained. Physical recycling, such as using human waste as a fertiliser, can be seen as the recycling of undesirable and dirty things that cause sanitary problems into sacred and pure things such as the creation of food. In such a way, the physical recycling was reinforced by consensual narratives to create an additional sense of value to disposal.[9]

Another spiritual aspect of recycling is seen in the relationships within Edo culture. Similar to the Tokyo of today, Edo was the cultural capital of Japan. The city provided various kinds of entertainment and activities. For the citizens to be sustained spiritually within the city, it was

necessary for them to experience cultural activities free from the physical restrictions of daily life under the rigid political system.[10] In this way, the individual's consciousness of urban life was contributed to sustaining a balance between the spiritual freedom to enjoy themselves and the physical restrictions required for the city to function properly. This integration of the physical and the spiritual recycling can be seen as one of the significant elements of Edo as an eco-city.

6.1.2 Wood distribution: A critical view of Edo

Currently, the position that Edo seen as an eco-city is mainly advanced by ecologists. However, this argument only covers one aspect of the greater sustainable system under Tokugawa feudalism. The class distinction had a crucial role in the circulation of limited resources in the society. Physical sustainability was based on the social hierarchy, which allowed the upper classes to consume excessively and to restrict the lower classes physically.

As already mentioned, Edo was the market of mass consumption, and wood was already being supplied from all over Japan. This large amount of material consumption was caused mainly by the scrap and build of housing in the Edo period. The traditional wooden housing was based on various natural materials, such as soil, reed, straw, bamboo and bark, which degrade naturally in Japan. In the hot and humid climate, high durability could not be expected of the housing. As a result, housing was based on the short cycle of scrap and build, keeping within the ecological reproductive cycle. This means that the Edo housing design system was open-circuit. Apart from the short housing durability, Edo frequently experienced fires, which burnt down not just a single house at a time, but large built-up areas. The resulting destruction created new and continual demand for construction. Some of the large fires during recessions may have been caused deliberately. It could be argued that fires in the Edo period contributed to creating new housing construction, sustaining the urban economy.[11]

Due to the increasing number of houses constructed, by the mid- and late-seventeenth century, Japanese woodland had already faced a shortage of resources, especially of good quality wood. Higher quality wood was only available for building castles, mansions for high-ranking officials and large farmhouses for well-to-do citizens. Although conflicts between economic demands and ecological sustainability had already emerged in the Edo period, the restricted material supply within Japan based on the strong political power inevitably led to compromise between the economic and ecological imperatives. In order to sustain material production in the face of wood shortages, the shogunate and

local governments issued regulations controlling overcutting and creating tree plantations.[12] At the same time, to reduce consumption of materials to within naturally recyclable levels, the unique social system of hierarchical social stratification developed in the city of Edo. The sustainable system that balanced individual life and the distribution of resources only worked properly in the strong feudalism, which forced particular groups of citizens to stay within restricted physical and economic conditions. While the samurai and some of the more affluent citizens in Edo indulged their desires, chronic resource shortages forced the lower classes of people, such as merchants and artisans, to live with severely restricted resources. In these severe conditions, it was crucial that citizens discover ways of optimising the available resources in order to physically sustain their daily lives. Susan B. Hanley, a historian, summarises the energy saving as follows:

> "In order to save on fuel, the Japanese developed methods of providing heat using the principle of heating the body rather than the air in the room. They also made maximum use of the climate and weather to provide a comfortable atmosphere for people, rather than trying to keep it out. ...the type of Japanese housing that became increasingly popular during the Tokugawa period took full advantage of summer breezes and what sun there was in winter. And in inclement weather, rooms could be made into cosy spaces by closing all the fusuma and shoji, and in the worst weather the wooden storm doors as well"[13]

Her argument shows that housing construction and operation were based on the individual's consciousness of maximising resource efficiency. The openness of the housing cooled the indoor temperature as well as extending the housing's durability in the humid climate. Small fires provided the maximum heating efficiency by conveying heat directly to the human body, rather than raising the whole indoor temperature that requires much more energy to secure the same degree of comfort. The citizens' unique culture developed in part due to the process of dealing with resource shortages. Hanley points out that:

> "... during the Tokugawa period when Japan's economy reached new heights of prosperity, giving rise for the first time to a true commoner culture, population increase added to an already high base population. This led Japanese in the seventeenth century to follow frugal, resource-conserving trends found in the medieval period, rather than create a new culture based on plenty as occurred in Europe."[14]

In spite of the current positive understanding of Edo as an eco-city, it was not primarily designed to be an ecologically sustainable city. This characteristic emerged as an unavoidable result of sustaining the Tokugawa's authoritarian power politically and economically. Consequently, the equilibrium of ecological, economic and socio-political sustainabilities sought by the authorities threatened the basic human survival needs of the lower classes. But these severe conditions provided them with the opportunity to develop a unique culture for themselves. Edo, as an eco-city, produced for its citizens a resource-conserving culture in search of a sustainable lifestyle.

6.1.3 The current situation

The urban area and population of Edo grew throughout two periods of modernisation: the Meiji Restoration starting in 1868 and the post-war period of modernisation after 1945, followed by the current ecologically unsustainable condition found in Tokyo. This trend, based on economic sustainability, has continued from the Edo period to this day. The current Japanese bureaucracy and political decision-making are rooted in the Tokugawa political economic system of feudal Edo.[15] Dramatically increased resource and energy supplies into Tokyo from abroad have allowed industrio-economic activity to expand, ensuring economic sustainability. At the same time, abundant resources based on international trade no longer need to seek a compromise with ecological sustainability as was crucial in the Edo period when the supply of resources was restricted. Continuity exists from Edo to Tokyo in the sense that economic sustainability has been, and still is, the primary political objective. Economic sustainability was secured by the short lifespan of buildings based on a scrap and build approach. For construction to carry on, wood was accumulated from all over the world. In present day Tokyo, scrap and build is no longer required due to the shorter durability of housing and the absence of the frequent fires of the Edo period. Instead, what has replaced these driving forces is the creation of demand for higher standards of living. Scrap and build, which has been occurring continuously from Edo until the present, is symbolic of economic sustainability.

The individual's life, also, has been emancipated from political and economic restrictions. Almost all citizens are allowed to indulge their own desires to some extent, as only the warriors and elite merchants were privileged to do in the Edo period. Huge numbers in the lower classes, who were physically restricted and forced to recycle products as much as they could, no longer exist. Although

some theorists argue that Edo is the model for Tokyo as an eco-city, these fundamental differences to the social structure would make it difficult to reconstruct Tokyo as a sustainable city. If the search for a sustainable city only emphasises ecological aspects and their equilibrium with economic and socio-political sustainability, the individual's potential for spiritual development may eventually be hampered. Such a movement could even be the beginning of another authoritarian trend in Japan by increasing control over the individual's life.[16]

In applying an anthropocentric position which is central to the present study, the main argument will be explored from the individual's perspective and the point of view of human needs. In Edo, the citizens discovered spiritual sustainability — the "recycling of spirit" through a unique sense of value within the restricted conditions. This is a manifestation of the human potential to sustain the self spiritually, and demonstrates the possibility of creating a certain quality of life even with lower standards of living. However, this spirit seems to have disappeared since the Meiji Restoration through the pursuit of higher standards of living. This shows a crucial discontinuity of spiritual sustainability.

6.2 Spiritual Discontinuity

> "... we distort the arts themselves to curry favour for them with the machines."
>
> Tanizaki Jun'ichiro[17]

> "... the more questioningly we ponder the essence of technology, the more mysterious the essence of art becomes."
>
> Martin Heidegger [18]

6.2.1 "Iki": the aesthetics of life and shadows

In criticising the economic sustainability continued from Edo to Tokyo, the significance of spiritual sustainability of Edo's citizens will become clear. This spiritual sustainability was at the heart of sustaining Edo as an eco-city for more than two hundred years.

The French historian Philippe Pons describes in his book D'Edo à Tokyo this popular tradition as the "anti-tradition", separate from the samurai culture. The current concept of the "tradition", re-

enforced by political powers, only focuses on the mainstream. The popular tradition diminishes in this situation, or is assimilated within the mainstream. In the Edo period, the traditional culture was restricted to the upper classes, such as the samurai and elite merchants with their great wealth. By developing transportation routes from all over Japan, Edo had become not only the largest consumption market, but also developed, by the late seventeenth century, the cultural mainstream represented by the term "culture of elegant accomplishments". As a result, popular culture, developed as the "other" Edo culture. This popular culture has been undervalued until recently in Japanese historical research.

The significance of the popular tradition as an anti-tradition, however, can be found within "the attitude to retrieve the individuals' autonomous conditions", defined as one of the essential points of Edo as an eco-city.[19] In contrast to Pons' definition of the culture of the upper classes and elite as the grand culture, the popular culture for the subordinate groups of people is defined as the small culture. The small culture was born of the counteraction to the dominant grand culture. However, it did not lead to attitudes directly confronting the dominance of Tokugawa feudalism. Instead it tended to escape social restrictions, securing the individuals' autonomy.[20] The small culture contributed to the transcendence of the physical restrictions, and discovered the alternative sense of value within the recycling. The small culture, therefore, is the manifestation of the "recycling of the spirit" as a way of spiritual sustainability, and of the autonomy of the self within the existing restrictions.

Just as culture is born from the spirit, the small culture is derived from the unique individuality of Edo citizenship (and citizens) known as "Edokko". According to the Japanese historian Matsunosuke Nishiyama, the qualities of Edokko are summarised in the following five points:

1. He receives his first bath in the water of the city's aqueduct: he grows up seeing the gargoyles on the roof of Edo castle.
2. He is not attached to money: he is not stingy. His funds do not cover the night's lodging.
3. He is raised in a high-class, protected manner. He is quite unlike either warriors or country bumpkins.
4. He is a man of Nihonbashi (the downtown area) to the bone.
5. He has "iki" (refinement) and "hari" (strength of character).[21]

Considering the strong restrictions, these characteristics show the pride of Edokko. As Nishiyama

explains, this pride, stemming from a spirit of resistance, represents independence from the higher class of warriors, the people from the provinces and the people of the wealthy Kamigata area, the former commercial capital now called Osaka. The Edokko coped well with the reality of poverty in the lower classes in that it did not make them suffer emotionally, but allowed them to imagine themselves as high class.

> "... the supposed "high-class" upbringing of the Edokko was nothing but an imaginary inversion of a childhood spent in poverty."[22]

The Edokko's culture was a way of creating spiritual equilibrium in a restricted society without changing the reality. Nishiyama calls the Edokko's world a "utopia on earth" in which reality is reinterpreted as fantasy.[23] This attitude comes about by accepting the reality of suppression, rather than directly resisting the superstructure. Based on this acceptance, Edokko express their urge for resistance within cultural activities of the imaginary world.

The two characteristics of "iki" and "hari" seem to represent the spiritual strength used to organise themselves within their own criteria. Through this organising process, the individual's activities are not always determined by exogenous factors, but are motivated by self-determination and self-reflection. One of the most famous interpretations of "iki" is seen in the work by Syuzo Kuki, a Japanese philosopher, titled The Structure of "Iki", which was published in 1930.[24] Kuki, who completed this book while studying in Paris and other European countries, had been influenced by then modern western culture. Pons points out that the decline of "iki" in premodern Edo society from its height towards the end of nineteenth century was similar to the fall of "dandyism" in contemporary western society, both of which are characterised by "melancholic moods".[25] There might have been some similar characteristics between "iki" as described by Kuki and "dandyism" as portrayed by Pons.

According to Kuki, "iki" is defined by three characteristics: "akirame" (resignation), "ikiji" (spirit) and "bitai" (eroticism). Corresponding to each of these definitions, Nishiyama defined three similar terms: "akanuke", "hari" and "bitai". In the present examination of spiritual sustainability, "akirame" (resignation), which corresponds to "akanuke" will be considered first.

> "The quality of "akanuke" demanded an unpretentious air, a thorough familiarity with all aspects

of life, and an unconcerned, unassuming character."[26]

Under the strong socioeconomic and physical restraints of Edo society, the Edokko felt it was their destiny to live in the city, and developed an attitude of indifference. Edokko separated the self from the social structure. This is represented by "ikiji" (spirit), corresponding to "hari".

> "Hari was a sharp, straight forward, coolly gallant manner that resisted all compromise, conciliation, and undue social adroitness or tact."[27]

As a representation of the Edokko's spirit of resistance, "ikiji" or "hari" is seen as a manifestation of the self-determining and self-reflective attitudes. This also shaped values of autonomy, by regulating the self with pride and dignity as Edokko. Based on their idealism regulated by this spirit, "bitai" emerged as another element of "iki".

> "Bitai" implied a kind of eroticism: but more important was the maintenance of a sense of charm. Any feigned high-class demeanour or uprightness was strictly taboo. Flirtatious allure and a light coquetry were allowed so long as they remained untainted by any vulgar or wanton feeling."[28]

It can be said that Edokko's socially established autonomous attitude by "akirame" was the pursuit of a subjectively established aesthetics of life through "ikiji" spiritually and "bitai" emotionally.

This definition of "iki" seems to correspond to Michel Foucault's argument of dandyism. Quoting from Foucault, Stephen K. White explains that:

> "[The] theme of an aesthetics of everyday life finds a modern counterpart, according to Foucault, in the nineteenth century idea of 'dandyism'... The dandy is the very existence of 'a work of art.' And, again, this 'elaboration of the self' is produced exclusively by attention to the body, pleasures and aesthetic form, not by attention to the social or political realms."[29]

"Ikiji" can be considered as an "elaboration of the self" replete with eroticism focusing on the body, pleasures and aesthetic form, based on an "aesthetic self-formation" without concern for the social or political realms. In this sense, "iki" and "dandyism" develop as their own senses of value, separate from their respective socio-political conditions.

When the argument focuses on the aesthetic expressions of "iki" in architecture, lighting becomes one of the most significant factors in creating "iki" in the space. Kuki proposes that for "iki" to be present, it needs to be separated from direct natural light by the eaves and trees. At night, faint lights in the darkness are also preferred in order to retain "iki" in the indoor environment.[30] His claim of a relationship between the lighting of Japanese architecture and "eroticism" in the context of "iki" is explored widely by the modern writer Jun'ichiro Tanizaki (1886-1965). In Tanizaki's essay In Praise of Shadows written in 1933, Tanizaki described the aesthetics of shadows that he had experienced in everyday life in Japanese housing.[31] The age when the two essays were written by Kuki and Tanizaki is considered to be the very time of the transition of individual awareness in daily life. But if the aesthetics of shadows as the antithesis of the domination of light are argued to be a metaphor of modern thought, Tanizaki's essay can prompt an inquiry into the meaning of the quality of life rather than standards of living.

Tanizaki develops the notion of the beauty of shadows in relation to the unique colour of the Japanese skin.

> "From ancient times, we have considered white skin more elegant, more beautiful than dark skin, and yet somehow this whiteness of ours differs from that of the white races...
> ... we see how profound is the relationship between shadows and the yellow races. Because no one likes to show himself to bad advantage, it is natural that we should have chosen cloudy colours for our food and clothing and house, and sunk ourselves back into the shadows. I am not saying that our ancestors were conscious of the cloudiness in their skin. They cannot have known that a whiter race existed. But one must conclude that something in their sense of colour led them naturally to this preference."[32]

"Bitai" or eroticism emerged from the uniqueness of the Japanese skin colour, through which the balance between lighting and the beauty of colour developed in the indoor space.

> "Our ancestors cut off the brightness on the land from above and created a world of shadows, and far in the depth of it they placed woman, making her the whitest of beings."[33]

The aesthetic sense of the place is represented by the beauty of women in the shadows, rather than the shadows themselves in the architecture. Japanese housing, therefore, is a medium through which

the aesthetics of "iki" are physically and practically created, which exhibits the ultimate form of the Edokko's small culture. In terms of architecture as the fusion of art and science, this aesthetic aspect of the housing only shows the architecture as art, while the science remains undefined. To examine the synthesis of art and science in architecture, the shadows, as a crucial element of the traditional housing, will be examined repeatedly from both an artistic and a scientific point of view. The discussion will be focus on the traditional aesthetics of housing and life as described in In Praise of Shadow.

6.2.2 Shadow: the aesthetics of Japanese housing

In the beginning of his essay, Tanizaki claims that the origin of the shadows in Japanese housing is rooted in its adaptation to the climate. The deep eaves, as one of the two architectural elements of Japanese housing, invariably cast shadows, which contributes to creating a comfortable indoor environment in summer.

> "... in the palaces of the nobility and the houses of the common people, what first strikes the eye is the massive roof of tile or thatch and the heavy darkness that hangs beneath the eaves.
>
> In making for ourselves a place to live, we first spread a parasol to throw a shadow on the earth, and in the pale light of the shadow we put together a house."[34]

The shadow that Tanizaki describes is created by the large roof of Japanese housing, which also gives the house a physical identity and even forms the psychological centre of the house. As Christian Norberg-Schulz claims, "the house really brings us inside and represents the need for being situated". The roof can act as a metaphor for the place where one is situated on the earth. Especially in Japanese housing, the shadow created by the roof physically marks the distinction between inside and outside without enclosing the space. Another architectural characteristic is that it enables a continuity of space, through its openness, from the inside to the outside. In this respect, the two elements of the roof and the shadow intertwine, creating the traditional housing style.

The spatial characteristics of Japanese housing also contribute to the comfortable indoor environment. From a practical point of view, a roof with deep eaves is derived from demands of the climate. A roof that creates shadows shades the house from hot, direct sunlight in summer, while the low winter sunlight can still enter sufficiently that it is effective for heating when it is cold outside.

In an aesthetic sense, there exists "a variation of shadows", or a "sensitive use of shadow and light" from the centre of the darkness in the middle of the house towards the light outside. For example, in Tanizaki's description of the texture and the colours of the walls, he points out the "tokonoma" (the picture alcove) as the darkest place with the hanging scroll and the flower arrangement. Each of them shows the depth of the shadows, and creates the gradation and the right balance of the variety of shadows for the whole room.[35] Beyond the visual aspect of the shadows in the house, he also describes "the magic of shadows" represented by the "complete and utter silence" and "immutable tranquillity" which lie in the darkness.

This aesthetic of the dark places created by the shadows could be thought of as "uncanny":

> "The "mysterious Orient" of which Westerners speak probably refers to the uncanny silence of these dark places."[36]

But this feeling is not simply the fear of darkness. The uncanny, which Westerners perceive in darkness and silence, is the fear of death. Sigmund Freud, for example, describes the duality of the "uncanny" as the "double" — the "belief in the soul" and "the fear of death". Since all men are mortal, they invent "doubling as a preservation against extinction".

> "From having been an assurance of immortality, he becomes the ghastly harbinger of death."[37]

Recently, Anthony Vidler in The Architectural Uncanny, has also identified the "double" aspect of the terrifying and the sublime within the "uncanny". He claims that the sublime resides in "images of the dead in some lasting materials".[38] As Gaston Bachelard suggests, a fear of "the dark entity" both day and night in cellars with their buried walls is difficult to rationalise even in the age of electrical lighting.[39] On the other hand, for the Japanese, that which is uncanny can also be perceived as quite normal, and the terrifying can be sublime. This duality of meanings seems to be desired in their unique sense of aesthetics, and manifests itself visually in their perception of the obscurity of shadows. Barrie Wilson notes that the purpose of darkness in Japan, which can also be seen in Tanizaki's essay is:

"... to diminish the distance between the viewing subject and the object viewed in order to allow vision to be drawn inwards."[40]

The fear of darkness in a Japanese traditional sense of value is not that of an external object, but rather fear within the imagination of the subject viewing it. In facing darkness as a metaphor for the fear of death, the Japanese have overcome their fear with a strength of belief in the soul, in which the terrifying is going to diminish and to transcend towards its sublime.[41]

6.2.3 Light as a part of dark

In the shadows and degrees of darkness in Japanese housing, small lights create a sense of beauty for the Japanese. Tanizaki notes the beauty of the harmony between Japanese lacquerware and dim candlelight:

"... in the still dimmer light of the candlestand, as I gazed at the trays and bowls standing in the shadows cast by that flickering point of flame, I discovered in the gloss of this lacquerware a depth and richness like that of a still, dark pond, a beauty I had not before seen."[42]

The relationship between the objects and the half-darkness created by small lights is a central concern in Japanese aesthetics. In Japanese housing, "hibachi" (a brazier) is used for the same purpose for warming as well as creating a small light:

"... without the red glow of the coals, the whole mood of winter is lost and with it the pleasure of family gatherings round the fire."[43]

Also, Heinrich Engel observes that:

"the hibachi is an economical and practical device, for with only a few pieces of charcoal properly buried in the ashes, a family of five or six, squatting around with hands stretched out, is not only supplied with sufficient heat for several hours but also with ready hot water for the esteemed green tea. Naturally, from such a position, no substantial work can be accomplished within the house, but a chat in the evening with the family while sipping steaming tea eventually may prove more rewarding than any business transaction in the office in town."[44]

"The red glow of the coals" in the darkness is essential for gatherings in the house, thus creating the centrality of the house. This corresponds to the hearth in Western architecture, which represents "the first sign of human settlement and rest".[45] The warmth comes not only from the heat of the "hibachi" since "the pleasure of family gatherings round the fire" increases the psychological warmth as well. The coldness of the housing and the darkness on winter evenings also reinforce the strong hierarchies of the space centred on both the light and warmth emanating from the "hibachi". Similarly, Bachelard says that the coldness and colourlessness of the snow in winter emphasises the existence of the house, making it the centre of warmth and peace in this simplified "cosmos".[46] The two characteristics of fire, sc. satisfying physical and psychological needs, and creating the perception of the house in a cosmological sense, may be essential elements in the construction of housing, both physically and poetically.

In a practical sense, Japanese housing is designed to be suitable during the hot summer months. On the other hand, the advantages derived from openness in summer bring considerable disadvantages during the cold winter. Engel claims that both the appropriateness and inappropriateness of the housing style to the Japanese climate are accidental. It cannot be said that the house is fundamentally designed to adapt to the climate.[47] With premodern technology, openness in the housing plan means a cold interior in winter, which may be thought of as inappropriate in terms of housing rationality or standards of living. Tanizaki, however, refutes Engel's argument:

> "... we Orientals tend to seek our satisfactions in whatever surroundings we happen to find ourselves, to content ourselves with things as they are; and so darkness causes us no discontent, we resign ourselves to it as inevitable. If light is scarce then light is scarce; we will discover its own particular beauty."[48]

The physical characteristics of Japanese housing cannot be argued only from the standpoint of its appropriateness to the climate. Since Japanese aesthetics demand the acceptance of reality, coldness through openness as well as shadows from the massive roof are regarded as the given reality which must be accepted. Even Tanizaki says:

> "elegance is frigid."[49]

The weakness of the "hibachi" compared to the hearth is necessary for preserving the aesthetic qualities of the space. Light should be developed in accordance with the beauty that the contrasting shadows create. What is revealed here is the concept of ecology in daily life. Wilson finds in Tanizaki's definition of beauty a connection with ecology.

> "... what he wants to let alone are the things we try to alter at great cost to the natural balance of our globe, and what he wants to change is generally something that requires a bit of effort and inconvenience, and a particular stance."[50]

In the "let things be" lifestyle, people endure inconveniences, in which they discover the beauty of daily life — the aesthetics of normality. Indeed, the inconveniences themselves seem to be a significant factor in stimulating aesthetic delight.

Tanizaki claims that:

> "The quality that we call beauty... must always grow from the realities of life."[51]

This clearly shows that beauty is developed through accepting reality rather than trying to change it, thereby creating an equilibrium between the standards and the quality. This also corresponds to Heidegger's definition of dwelling as "the sense of stays of mortals on the earth". The fundamental characteristics of dwellings are defined by "sparing" and "preserving":

> "To free really means spare. The sparing itself consists not only in the fact that we do not harm the one whom we spare. Real sparing is something positive and takes place when we leave something beforehand in its own nature, when we return it specially to its being, when we 'free' it in the real sense of the word into preserve of peace. To dwell, to be set at peace, means to remain at peace within the free, the preserve, the free sphere that safeguards each thing in its nature."[52]

In Heidegger's context, the two elements of Japanese housing: the roof and the hearth are essential for man to dwell on the earth. Tanizaki's argument is not only resonant with Heidegger's dwelling as "sparing", accepting the shadows for what they are, but also leads to "preserving" the shadows as a

part of the quality of life. As Tanizaki puts it:

> "Were it not for shadows, there would be no beauty,"[53]

The coldness and discomfort implicate in this ecological position already has an aesthetic dimension. This link between ecology and the human spirit is a fundamental part of Japanese housing.

6.2.4 The limitation of transparency

Since the Meiji Restoration in 1868, the Japanese government has promoted the modernisation of Japan, which is represented by the concept of "rationalisation". This promotion has also influenced the traditional housing style. Vidler calls modern architecture "transparent space", and what modernity has brought to architecture is to flood dark spaces with light. This influence of modern architecture can also be seen in Japan. Moreover, the transparent space of this age is one of the manifestations of rationalisation. Colin Rowe and Robert Slutzky argue in Transparency that transparency diminishes the contradiction of spatial dimensions:

> "... we become aware that here a transparency is effected not through the agency of a window but rather through our being made conscious of primary concepts which 'interpenetrate without optical destruction of each other'."[54]

Tanizaki's attack on the transparent space of Western-style buildings is founded on the practical meaning of the housing. He criticises the spatial rationalisation by penetrating light that is reinforced by the logic of "modernisation". He identifies the contradiction of modern technologies and their application in housing. Not only is it unsuitable in summer with the direct sunlight penetrating the interior, but the diffusion of electric lights also makes the situation worse by making the inside extremely hot even when it is cooler outside.[55] He claims:

> "A room should be brighter in winter, but dimmer in summer; it is then appropriately cool, and does not attract insects. But people will light the lights, then switch on an electric fan to combat the heat. The very thought annoys me."[56]

Technology has its own purpose: rationality through an issue being identified and resolved. It heralded a modern lifestyle as an alternative criterion of housing and the transparent space as symbols of rationality in the machine age. But the application of technology to housing causes other problems, to be taken care by yet other technological applications, and so on in an endless search for coherence among technologies in order to realise higher standards of living.

Modern space, symbolised by transparency, poses a simple question identified by Heidegger concerning the definition of technology:

> "The essence of modern technology lies in Enframing. Enframing belongs within the destining of revealing. These sentences express something different from the talk that we hear more frequently, to the effect that technology is the fate of our age, where 'fate' means the inevitableness of an unalterable course.
>
> But when we consider the essence of technology, then we experience Enframing as a destining of revealing. In this way we are already sojourning within the open space of destining, a destining that in no way confines us to a stultified compulsion to push on blindly with technology or, what comes to the same thing, to rebel helplessly against it and course it as the work of the devil. Quite to the contrary, when we once open ourselves expressly to the essence of technology, we find ourselves unexpectedly taken into a freeing claim.
>
> The threat to man does not come in the first instance from the potentially lethal machines and apparatus of technology. The actual threat has already affected man in his essence. The rule of Enframing threatens man with the possibility that it could be denied to him to enter into a more original revealing and hence to experience the call of a more primal truth. "[57]

In Japanese housing, there is its own revealing derived from the concept of dwelling. What the transparent space means is not only the assertion of light over dark, but also the Enframing of the human being within the order of scientific rationality. At the same time, this Enframing by modern technology blocks the other possibility of pursuing the aesthetics of life such as those Tanizaki finds in the shadows.[58] Excessive light demands spatial rationalisation, the traditional technique of Japanese housing. This rationalisation which can be seen as both "sparing" and "preserving", is becoming a modern technological kind of revealing.

Currently, technocentric approaches to deal with global environmental crises and reduce the impact on the environment are seen to be the continuous Enframing of human beings within the order of scientific rationality. Technocentric approaches are also the manifestation of the threat to the

aesthetics of Japanese housing encapsulated by Heidegger's term "dwelling". If individuals are facing the danger of technocentrism represented by Enframing as Heidegger claims, technocentrism will inevitably highlight the aesthetics of life symbolised by darkness as an another way of Enframing housing. Tanizaki's argument on the aesthetics of life is moving towards them being scientific in Japanese culture. He claims:

> "...I always think how different everything would be if we in the Orient had developed our own science..."
> "In fact our conception of physics itself, and even the principles of chemistry, would probably differ from that of Westerners: and the facts we are now taught concerning the nature and function of light, electricity, and atoms might well have presented themselves in a different form."[59]

The link described by Tanizaki between the spirit and ecology in Japanese housing suggests a specifically Japanese form of science. In this respect, housing technology should be developed to be uniquely appropriate to the individual, cultural, and social contexts of the place where the house belongs. In order to serve the residents' qualities of life, the technology must add richness to their daily lives. Such an interaction between the aesthetics of life and technology may be one way forward. At the same time, this definition of science challenges the current attempts of science and technology to reduce CO_2 emissions for reasons founded exclusively in technical parameters that cannot always interact with art.

Technology seems to imply non-technological factors, one of which can be seen in the pursuit of aesthetics in daily life or through contemplating the meaning of dwelling. Just as Heidegger claims that poesy is the measure-taking of design, technology can be gauged in terms of the narratives that imply a spiritual aspect to sustainability. [60] In such a modest approach to the individual's life and the use of technology that respects individuals, a fusion of art and science in architecture can be re-constructed. Heidegger's concept finds an echo in Tanizaki's concluding words:

> "... the essence of technology is nothing technological,"[61]

> "... perhaps we may be allowed at least one mansion where we can turn off the electric lights and

see what it is like without them."[62]

6.3 Towards an alternative continuity

6.3.1 From scrap and build to stock of housing

In the process of reconstructing the spiritual continuity of housing design, the "iki" of Edo culture and its aesthetics of life as described by Tanizaki in the modern period will be applied to the current housing situation. This application could contribute to separating the individual's sense of value from the dominating criterion of standard of living that cause scrap and build. In doing so, the aesthetics of life as an alternative criterion for housing may be revived.

In a practical sense, when individuals move into a house that was previously owned by someone else they contribute to a reduction in the number of old houses scrapped and new ones built. However, attitudes to second-hand housing are low as reflected by the corresponding low housing circulation level in Tokyo. In a 1997 public opinion poll, for detached housing, only 18% answered that "second hand housing is acceptable", and 79% answered "new housing is preferable".[63] Of the people who answered "second-hand housing is acceptable", the main criteria for choosing second hand housing were "I like the property" (64%), "the maintenance is reliable" (41%) and "the cost is cheaper than the same grade of new housing" (37%).[64] When the individual's decision-making is motivated by the belief that they "like the property", it means that this decision is not always derived from housing standards as the primary value, but is associated with more ambiguous personal factors. However, the increasing pursuit of the individual's desires, suggests it would be difficult to shift preferences of decision-makers in housing design. The lack of consensus on design is a crucial obstacle blocking second hand housing from finding new owners, making such housing stock rather than something to be scrapped. The aesthetics of traditional housing has a significant role to play that in managing this situation: to converge, within a historical context, the current fragmented preferences of individuals with housing design. If each individual finds a common sense of value in the present and the past, the traditional housing style could be a nexus between them, symbolically implying both within its design and space. This could be an alternative strategy for sustainable housing design to reduce scrap and build using spiritual atavism and continuity.

This argument cannot easily be generalised for the purpose of formulating a hypothesis because of the uniqueness of each individual's beliefs and attitudes to housing. The following argument will focus on only one detached house and the transition of the residents' consciousness of it. Although this analysis does not mean that this strategy can be applied to every individual and house design, it will show one of the possible ways of extending housing lifespan by drawing on the individual's beliefs within a historical context.

6.3.2 Personal narratives: Minami House

Minami House was built in Shinjuku-ku at the centre of the 23 Ku at the beginning of the twentieth century, and is a traditional Japanese house.[65] After his mother's death, Yuzo Minami inherited the house in the late 1980s.

> "In moving to a purely Japanese style house from a modern flat, the house seemed so antiquated that my children were a bit uneasy. In time, however, I have taken a different view: that the house is so versatile that we can adapt ourselves to its atmosphere."[66]

His first impressions of the house, and those of his children, are expressed by the word "uneasy". But their impression is changing so that they are at ease with it describing the house as "versatile" as they become used to it.

> "...Since then, I have been carefully observing the house and gradually appreciating Japanese housing: the style of the walls, the enchantment of the veranda, the lighting effects of the paper screen and so on."[67]

He discovers the aesthetics of the house in the traditional light and the comfortable space. The land area of Minami House is 195 m^2, which is slightly smaller than the current average in Tokyo of 203 m^2. The floor area, however, is 114 m^2, which is only 56% of the current average of 176 m^2.[68] Despite the limited floor area, Minami had the feeling of plenty of indoor space because of the multi-purpose living room connected to the adjoining room by sliding partitions. Also, as shown in Figure 1, the continuous space from the inside to the outside of the house through the veranda made it feel much more spacious. These are the basic characteristics of traditional Japanese housing, and Minami's experience shows that they still appeal to people. Gradually, he and his family realised the depth of

traditional housing, sharing the same space and the same sense as their ancestors.

Also, the Japanese architect Kisyo Kurokawa claims that:

> "Because of the versatility of tatami-floored rooms, Japanese houses have escaped a throughgoing division of space by function. The multipurpose tatami-floored room becomes a bedroom when you pull the futon mattresses out of the closet and spread them on the matting. When you place a low table in the centre of the room, it becomes a dining room. Set floor cushions here and there and you have a room to receive guests. Place a flower arrangement and hand a scroll in the tokonoma, and you have a tea room. By changing the signs — the décor — one room makes time sharing possible and in this way we triumph over the limitation of a relatively small space."[69]

It would be difficult to comprehend Kurokawa's argument without experiencing the real space. The Minami family has discovered its utility by living in and experiencing traditional housing. The tradition is no longer a part of history, but exists in their daily lives, confirming that traditional housing is still applicable to current ways of life.

Minami's discovery of the traditional house is not limited to the general characteristics of the housing design, but also extends to more personal memories of it. The house reminds him of various events in the past because his parents had been living there. The space has a double meaning as a traditional house from a practical viewpoint and as his parents' house from a personal viewpoint, which strengthen his attachment to the house. This leads to a strong identification of the self with the house.

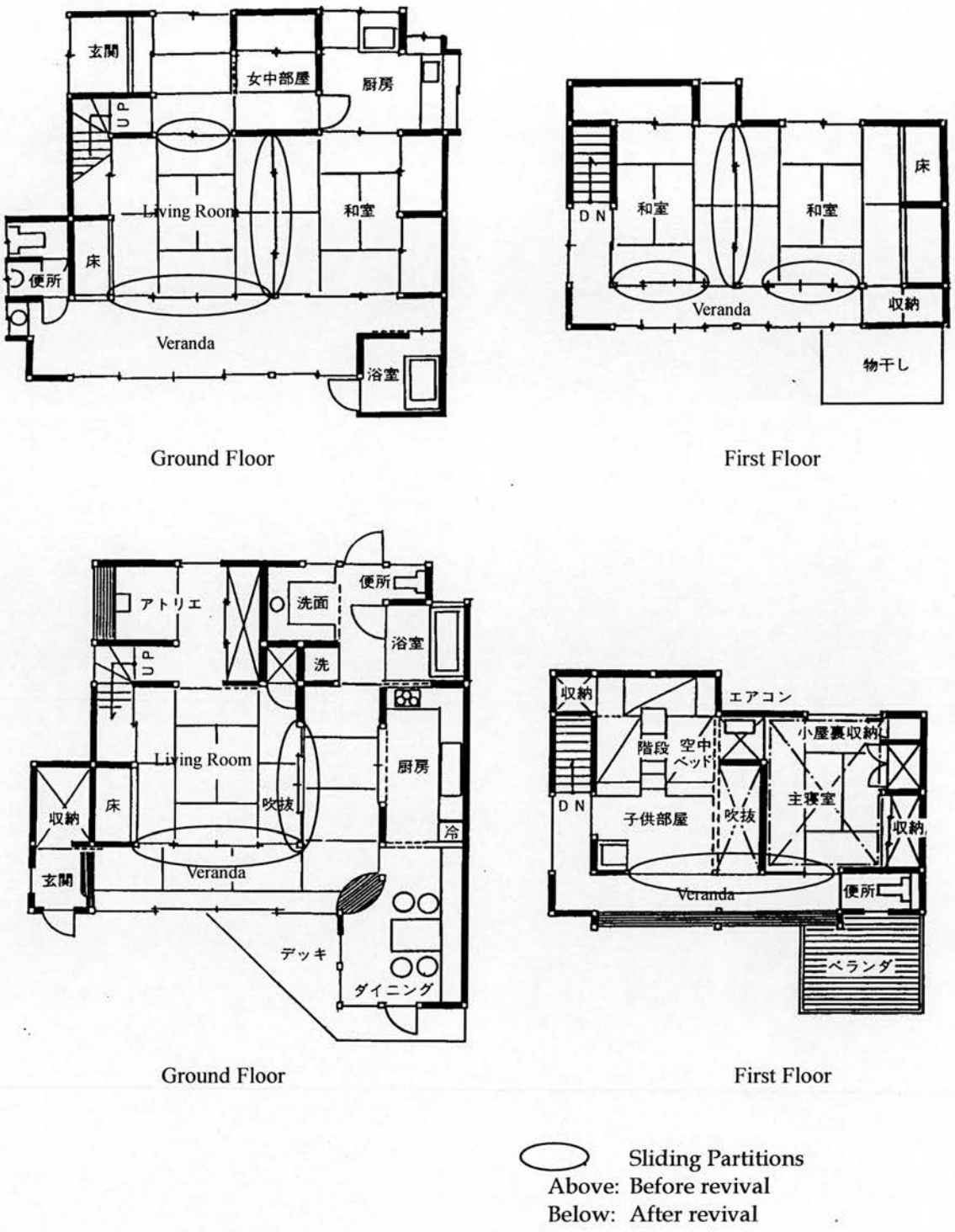


Figure 1: Plans of Minami house (before and after the rebirth)

Source: Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House] (1996), p. 3.

The house, which is already 70 years old, is just about reaching the end of its lifespan. But the alterations to the house has made Minami decide to preserve, not demolish it.

> "I was deeply impressed by the idea of "revival" which gives a new lease of life to the buildings which have already completed their life span,... and I really thought that the pleasure of having old things (good things) is worth much more than the pleasure of having a new house."[70]

The Minamis' decision to sustain the house is not only made after experiencing the house itself. The parents' memories of the house have evoked very personal emotions, giving Minami a responsibility for the inherited house. He also expresses his feeling in the process of the house's revival:

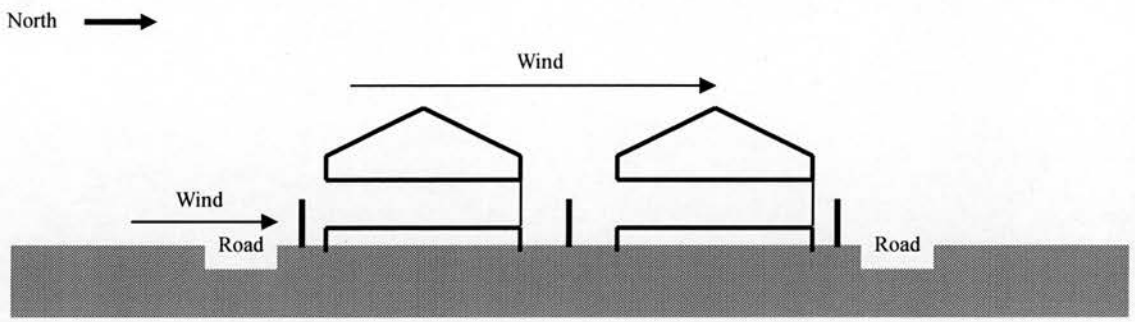
> "In mowing down the thickly grown garden trees, I could not help feeling sinful, because I was burying the garden which had been taken care of since my parents' time. I was relieved that I was at least trying to sustain the house."[71]

His decision-making derives from the self-reflective attitude seen in the narrative. In the same way Heidegger claims poetry is the measure-taking of design, the implied meanings of his words are the criteria for the design of Minami House, leading him to decide to give the house a new lease of life. This process has succeeded in separating the individual's beliefs about the housing's design away from primary concern for the standard of living and the cost. The standards are replaced by the criteria rooted in the attachment to the house. The individual's identity is preserved with the housing space at any cost.

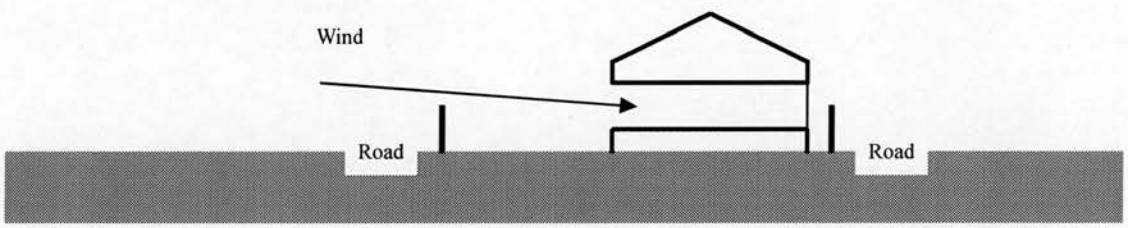
From an ecological point of view, the smallness of the house will have a crucial significance in reducing energy consumption. In the early twentieth century, when natural ventilation was the only way of satisfying the physical need, the smallness and the openness of the housing was crucial. People could be satisfied with the need for more room by applying the concept of multipurpose space without physically extending the space. At the same time, the decision will contribute to retaining the open space around the housing in the residential areas, optimising natural ventilation of the indoor space. The differences between the two sections, namely the current average housing and the Minami house, are shown in the two parts of Figure 2. This figure shows that the ethos of the traditional housing is

not only to be found in the architectural form, but also the existence of the required traditional lifestyle.

Another ecological point that the house has is its veranda. Minami realised that the traditional housing's design with a south-facing veranda is ideal for passively absorbing direct sunlight into the house in winter. At the same time, the disadvantage of openness in winter remains as its characteristic as shown earlier in this chapter. However, it is dramatically improved in the house's revival by applying high insulation and airtight technology without destroying the smallness, sliding partitions, and south-facing veranda of the original traditional house. This marriage of the traditional housing style and the current technology is the realisation of an alternative fusion of art and science.



Current condition of the low-rise housing area (Tokyo 23 Ku)



Minami House (Sinjuku Ku)

Figure 2: Comparison of the site section between current and traditional housing

Minami's attitude, as seen in the house's revival, opens a possible spiritual continuum from the Edo period to the present. His attitude could be summarised by the concept of "iki" and its way of living. Preserving the house's aesthetics comes from "akirame" (resignation) to the endless pursuit of what they want and the acceptance of each individual's destiny. For Minami, his destiny could be said to be his succeeding to the house's ownership. Also, his and his family's discovery of the aesthetics of the house developed through their own sensuous pleasure of living there, can be thought of as "bitai" (eroticism). The attitude the family develops leads to the more parsimonious use of energy, a saving of

resources for other people who need them.

This could be a manifestation of the self-reflective attitude of "ikiji" (spirit). Although the manifestation of the aesthetics in Japanese housing is different from those sought in "iki" in the Edo period and from what is identified by Tanizaki, a spiritual continuity in the current context can be observed in the revival of the house. Minami creates his own sense of value and the aesthetics of life. The past is no longer disconnected from the present, but could have significant meaning for the current way of living.

From an architectural point of view, the alternative indoor space that reflects Minami's decision-making can be summarised by the concept of multipurposeness. Ordinary people have to live in restricted indoor spaces because of the higher land prices in central Tokyo. This physical characteristic has not changed fundamentally since the Edo period. Kurokawa's argument presents the traditional ethos of life in urban areas, while accepting the reality of limited space. He argues that the concept of multipurposeness of the rooms is crucial for optimising the limited space, which can be satisfied by retaining the original features of the house.

The example of Minami house demonstrates the result when alternative technologies are applied to a particular cultural condition, supporting Tanizaki's argument that science can be defined differently according to cultural variations. At the very root of this idea, there is the strong relationship between the aesthetics of life and the traditional architectural style. If the objective attitude of scientific knowledge dominates housing design, the individual's sense of value rooted in both the traditional and in private memories will be absorbed into the global standard. But in defining the concept of ecology within the fusion of art and science, the sense of beauty that ensures the individual's identity must be secured first, and the physical disadvantages taken care of by technological applications. High insulation and airtight technology is no longer the primary factor in creating ecological housing design. It is only applied in order to subordinate the way that Minami dwells in Heidegger's sense, rather than forcing him within the current technological rationality. Through the renaissance of his house, Minimi has succeeded in retaining his own identity as a member of his family and of preserving the traditional way of life.

In order to build housing in the traditional manner, the existence of skilled builders is essential. But in the current construction environment dominated by factory-made materials based on less

skilled work, the traditional builders have been losing opportunities to use their skills. The renaissance of traditional housing gives traditional techniques the opportunity to continue. Moreover, the builders' and the users' spirits are joined through the process of reviving the house. Minami's feeling towards the builders are expressed as follows:

> "With great passion, the two carpenters had been serenely proceeding with their work without complaining about anything even through they were facing difficulties. Looking at their faces, I felt like they were much more deeply involved in the construction of the house than I was."[72]

The Minamis, as the users of the house, make decisions through their own sense of the place in order to satisfy their needs for a dwelling. On the other hand, the builders design and complete the house's revival through their skills and experience, thus satisfying their need for creation. While both the family's and the builder's needs are distinct, their needs are identified, and are symbolically represented within the same design process and house.

As seen in the example of Minami house, the reduction of scrap and build is not directly related to the individual's awareness of the need to reduce CO_2 emissions. The extension of the housing's lifespan is evaluated and decided upon based on the personal narratives of both the users and the builders, with the search for beauty as the central concern. The negative process of housing design in Tokyo discussed in Chapter 5, shows that a technological approach for ecological sustainability could result in increasingly socially unsustainable conditions. What is required to change this trend may be found in re-evaluating small housing, and restoring the residential environment physically and socially by opening up the housing. This direction would oppose the way pursued by conventional Japanese "progressives", but would not require them to actively capitulate. Rather, it would be preferable for residents to foster a sense of neighbourhood by understanding the traditional Japanese sense of values and the self-reflective attitude. This would lead towards a spiritual sustainability by with individuals identifying their responsibility for society. This attitude would parallel the ways of living expounded by Tanizaki and Heidegger.

Global environmental issues may provide individuals with an opportunity to inquire about the issues within their community and the current ways of living. To seek answers to the questions these issues raise, more comprehensive discussion about sustainability beyond mere technological

arguments will be needed.

---

1 James L. McClain and John M. Merriman, 'Edo and Paris: Cities and Power', in Edo and Paris: Urban Life and the State in the Early Modern Era, eds. James L. McClain, John M. Merriman and Ugawa Kaoru (Ithaca, NY: Cornell University Press, 1994), p. 13.
2 James L. McClain and John M. Merriman, 'Edo and Paris: Cities and Power', in Edo and Paris: Urban Life and the State in the Early Modern Era, pp. 14-21.
3 Susan B. Hanley, Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture (Berkeley, LA: University of California Press, 1997), p. 75. To secure an efficient supply of resources, the Tokugawa shogunate constructed transportation infrastructures. One example is the 'Tokaido' road. It was opened in the early seventeenth century, connecting Edo, Osaka as the commercial and former capital, and Kyoto in order to connect the major production area (Osaka) and the new consumption area (Tokyo).
4 Eco-Polis Cenre, Itabashi Ecopo [Eco-Polis Centre news] (October and November 1996).
5 See: Noboru Haga, Dai Tokyo no Shiso [Thoughts of Greater Tokyo] (Tokyo: Yuzankaku, 1992), and Norihiro Mihashi, Mori to CO_2 no Keizaigaku: Chikyu Ondanka Taisaku eno Shinteigen [Economics of Forests and CO_2] (Tokyo: PHP Kenkyujo, 1997).
6 Noboru Haga, Dai Tokyo no Shiso [Thoughts of Greater Tokyo], pp. 21-31.
7 Toshio Kitahara, Edo no Kankyo Kanri System [Edo Environmental Management Systems] (Material from the Architectural Institute of Japan), pp. 129-132. For example, paper, metal, and cloth were typical materials for recycling.
8 Toshio Kitahara, Edo no Kankyo Kanri System [Edo Environmental Management Systems], pp. 129-132.
9 Susan B. Hanley, Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture, p. 111, Noboru Haga, Dai Tokyo no Shiso [Thoughts of Greater Tokyo], p. 26.
10 Noboru Haga, Dai Tokyo no Shiso [Thoughts of Greater Tokyo], pp. 28-30.
11 Kozo Suzuki, Edo no Keizai Seisaku to Gendai [Economic Policies of Edo and the Present] (Tokyo: Business Kyoiku Syuppansya, 1993), pp. 13-4.
12 Susan B. Hanley, Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture, pp. 54-5
13 Susan B. Hanley, Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture, pp. 60-1.
14 Susan B. Hanley, Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture, p. 75.
15 Kozo Suzuki, Edo no Keizai Seisaku to Gendai [Economic Policies of Edo and the Present], pp. 196-9.
16 See: Chapter 4.
17 Jun'ichro Tanizaki, In Praise of Shadows, trans. by Thomas J. Harper and Edward G. Seidensticker (Tokyo: Charles E. Tuttle, 1977), p. 9.
18 Martin Heidegger, The Question Concerning Technology and Other Essays, trans. by William Lovitt (New York: Harper & Row, 1977), p. 35.
19 Pilippe Pons, D'Edo à Tokyo, trans. in Japanese by Mikio Kamiya (Tokyo: Chikuma, 1992), p. 9
20 Pilippe Pons, D'Edo à Tokyo, p. 27-9.
21 Matsunosuke Nishiyama, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, trans. by Gerald Groemer (Honolulu: University of Hawai'i Press, 1997), p. 42.
22 Matsunosuke Nishiyama, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, pp. 42.
23 Matsunosuke Nishiyama, Edokko (Tokyo: Yoshikawa Kobunkan, 1980), pp. 153-4.
24 Syuzo Kuki, "Iki" no Kozo [The Structure of 'Iki'] (Tokyo: Iwanami Bunko, 1997).
25 Pilippe Pons, D'Edo à Tokyo, p. 67.
26 Matsunosuke Nishiyama, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, p. 54.
27 Matsunosuke Nishiyama, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, p. 54.
28 Matsunosuke Nishiyama, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, p. 54.

29 Stephen K. White, The Recent Work of Jürgen Habermas: Reason, Justice and Modernity (Cambridge: Cambridge University Press, 1988), p. 146. Also, see Michel Foucault, Power/Knowedge, Selected Interviews and Other Writings 1972-1977, trans. by Colin Gordon, Leo Marshall, John Mepham and Kate Soper (New York: Harvester Wheatsheaf, 1980).
30 Syuzo Kuki, "Iki" no Kozo [The Structure of 'Iki'], pp. 78-9.
31 Jun'ichro Tanizaki, In Praise of Shadows.
32 Jun'ichro Tanizaki, In Praise of Shadows, pp. 31-3.
33 Jun'ichro Tanizaki, In Praise of Shadows, pp. 31-3.
34 Jun'ichro Tanizaki, In Praise of Shadows, p. 17.
35 Jun'ichro Tanizaki, In Praise of Shadows, pp. 18-9.
36 Jun'ichro Tanizaki, In Praise of Shadows, p. 20.
37 Sigmund Freud, "Uncanny", in Collected Papers, Vol. IV, Sigmund Freud, trans. by Joan Riviere (London: Leonard & Virginia Woolf, 1925), p. 387.
38 See: Anthony Vidler, The Architectural Uncally; Essays in the Modern Unhomely (Cambridge, Massachusetts: The MIT Press, 1992), pp. 20-5, and Sigmund Freud, "Uncanny", in Collected Papers, Vol. IV, Sigmund Freud, trans. by Joan Riviere, pp. 375.
39 Gaston Bachelard, The Poetics of Space, trans. by Maria Jolas (Boston: Beacon Press, 1994), pp. 17-20.
40 Barrie Wilson, "The Aesthetics of the Good Life", in Edinburgh Architecture Research,Vol. 20 (1993), p. 117.
41 Martin Heidegger, "Building, Dwelling, Thinking", in Rethinking Architecture: A reader in cultural theory, ed. Leach, Neil (London: Routledge, 1997), p. 102.
42 Jun'ichro Tanizaki, In Praise of Shadows, p. 13.
43 Jun'ichro Tanizaki, In Praise of Shadows, p. 3.
44 Heinrich Engel, The Japanese House; A Tradition for Contemporary Architecture (London: Charles E. Tuttle, 1964), p. 360-1.
45 Gottfried Semper, The Four Elements of Architecture and Other Writings, trans. Harry Francis Mallgrave and Wolfgang Herrmann (Cambridge: Cambridge University Press, 1989), pp. 101-4.
46 Gaston Bachelard, The Poetics of Space, pp. 211-2.
47 Heinrich Engel, The Japanese House; A Tradition for Contemporary Architecture, p. 359.
48 Jun'ichro Tanizaki, In Praise of Shadows, p. 31.
49 Jun'ichro Tanizaki, In Praise of Shadows, p. 3.
50 Barrie Wilson, "The Aesthetics of the Good Life", in Edinburgh Architecture Research,Vol. 20, p. 119.
51 Jun'ichro Tanizaki, In Praise of Shadows, p. 18.
52 Martin Heidegger, "Building, Dwelling, Thinking", in Rethinking Architecture: A reader in cultural theory, p. 103.
53 Jun'ichro Tanizaki, In Praise of Shadows, pp. 30.
54 Colin Rowe and Robert Slutzky, Transparency (Basel, Switzland: Birkhäuser Verlag, 1997), pp. 38.
55 Jun'ichro Tanizaki, In Praise of Shadows, pp. 37-8.
56 Jun'ichro Tanizaki, In Praise of Shadows, p. 37.
57 Martin Heidegger, The Question Concerning Technology and Other Essays, pp. 25-6. Heidegger defines 'Enframing' as:

> 'We now name that challenging claim which gathers man thither to order the self-revealing as standing-reserve: "Ge-stell" [Enframing].

58 See: Martin Heidegger, The Question Concerning Technology and Other Essays, p. 26.
59 Jun'ichro Tanizaki, In Praise of Shadows, pp. 7.
60 See: Chapter 2 and Martin Heidegger, "... Poetically Man Dwells...", in Rethinking Architecture, ed. Neil Leach (London: Routledge, 1997).
61 Martin Heidegger, The Question Concerning Technology and Other Essays, p. 35.
62 Jun'ichro Tanizaki, In Praise of Shadows, p. 42.
63 Tokyo To, Cyuko Jutaku oyobi Reform ni Kansuru Ishiki Chosa [A Survey On Attitudes to Second Hand Dwelling and Its Reform] (1997), p. 14.
64 Tokyo To, Cyuko Jutaku oyobi Reform ni Kansuru Ishiki Chosa [A Survey On Attitudes to Second Hand Dwelling and Its Reform], p. 18.

65 See: Yuzo Minami, "Kokimitsu Kodannetsu Jutaku no Jissen Koza", in Kenchiku Gijutsu [A Practical Guide for High Insulation and Airtight Housing] (July 1996). Minami introduced his own housing "Minami House" in the journal as an example of passive solar heating based on Japanese traditional housing.

66 Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House] (1996), p. 2.

67 Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House], p. 2.

68 For the average data of housing in Tokyo (Setagaya, Nerima and Ogikubo wards), see: Chapter 5.

69 Kisyo Kurokawa, The Philosophy of Symbiosis (London: Academy Editions, 1994), p. 69.

70 Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House], p. 2.

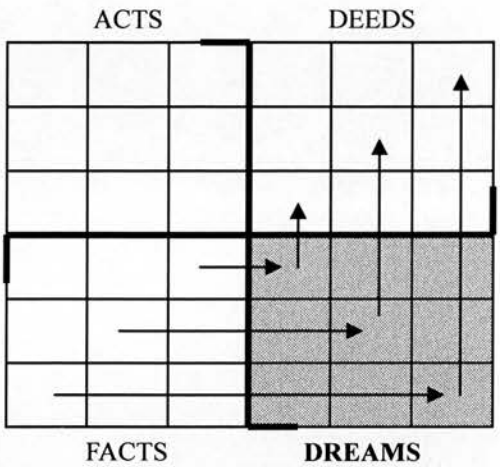
71 Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House], p. 2.

72 Yuzo Minami, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House], p. 12.

CHAPTER 7:

Towards A Reconstruction of "Dreams":

Hokkaido



Hokkaido has a different history from Tokyo and the rest of the mainland. Hokkaido was originally the island of the Ainu, an ethnic group distinct from the Japanese. Among the Japanese, people from Hokkaido were called "Ezo" and their land was known as "Emishi", which mean the "savages" and the "place of the savages", respectively. In the 9th century, there was already trade between the two countries, but the amount was limited because of the geographical separation and the primitive forms of transportation. After the collapse of the Tokugawa shogunate in 1868, the Meiji government started redeveloping the land of Hokkaido. In 1869 the name "Ezo" was changed to "Hokkaido", as it is still called today, and it officially became part of Japan. As a result of Japanese hegemony, the Ainu's territories and culture were vitiated continually over a period of a hundred years.

Today, the people of Hokkaido are called "Dosanko" (the "do" of Hokkaido being the same as the "do" of "Dosanko"), just as Edo residents were called "Edokko". The "Dosanko" developed unique social characteristics in the new place. The Dosanko's customs have developed through a mixture of various regional characteristics brought by waves of immigrants at different times in history.

In this chapter, the discussion of Hokkaido starts with the Ainu's culture in premodern Hokkaido, which sustained their way of life physically and metaphysically for centuries. This will be contrasted

with the subsequent Japanese culture, both how they differ generally and with regards to the current unsustainable condition of wood production.

7.1 Continuity: Premodern Hokkaido and the Ainu

7.1.1 The Ainu: Premodern Hokkaido

In the ancient period, the Ainu had moved from the Asian Continent to Hokkaido and the northern part of the mainland. The Ainu language falls within the same group as those of Siberia from where the Ainu originally came. Their language belongs to a different group from the Japanese language. They had no written language, and their history was conveyed through narratives: story telling and mythology. Since they had a hunting-based society, ecological sustainability was crucial for their physical survival. Their understanding of the land is expressed in terms of animism. "Kamui" or gods (or spirit-gods) of the Ainu, which manifests themselves within living things, objects and natural phenomenon, such as bears, mountains, the sun, wind, and even the illness.[1] Communication with the gods who controlled their daily lives was mystical, and the will of the gods were divined by shamans.

According to the Japanese linguist, Takako Yamada, "kamui" normally have one of three meanings:

1. Representations of roles and social functions: for example, dictators and creators,
2. Spatial representations: for example, mountains, seas and sky, and
3. Things: animals (such as birds), plants (such as trees) and objects (such as stones).[2]

The Ainu's perception of place represented by these three types of gods, is cognate with the concept of "genius loci". Genius loci, an Ancient Roman concept, means "the spirit of the place". Norberg-Schulz, described it as follows:

> "... every 'independent' being has its genius, its guardian spirit. This spirit gives life to people and places, accompanies them from birth to death, and determines their character or essence..."
>
> "The landscape where he lives is not a mere flux of phenomena, it has structure and embodies meanings. These structures and meanings have given rise to mythologies (cosmogonies and cosmologies) which have formed the basis of dwelling."[3]

The Ainu's living places are filled with gods, which direct their lifestyle and their use of the land, shaping their perception of the world. In his study of genius loci, Norberg-Schulz proposes three modes of understanding the natural world:

1. The definition of the character of natural places, relating them to basic human traits
2. An abstract systematic cosmic order from the flux of occurrences, and
3. Concrete natural elements, or "things"[4]

The three modes seem to correspond to the Ainu's three meanings of kamui, explaining the structure of their perception of the place. For them, creation consists of two worlds: the Ainu's world and the world of the gods (or spirit world). The Ainu situate their villages at the centre of the world, corresponding to the definition of natural places related to human traits. The abstract spatial structure is created in the gods' world. It is divided into four directions: horizontally with the "mountains" as the upstream and the "sea" as the downstream, and vertically with the "sky" as up and the "earth" as down. The Ainu perceive these distinctive places through animals symbolising the gods: bears in the mountains, whales in the seas, birds in the sky, and snakes and insects in the villages. But the Ainu's concept of gods does not only mean a conception of a mystical spatial structure. It also encompasses their comprehension of ecological systems. According to Yamada, the concept of kamui extends to the roles and functions of their daily lives. For example, the Ainu believe that bears in the mountains and whales in the seas are the summit of the food chains in those places.[5] The bear is the ruler of mountains and brings the people meat to eat and furs to wear, and the whale as the ruler of the seas brings them food. Trees in forests are used for fuel and as the material from which tools and dwellings are made.

The Ainu's mystical and practical perception of places manifests itself in their use of land. Geographically, their territories consist of one or more water groups. According to the Japanese anthropologist Hitoshi Watanabe, they fall into five zones.[6] Each zone is defined by particular activities, making the best use of its geographical and ecological characteristics. The Ainu's narrative knowledge described above enables them to sustain self-sufficient lives within their own territories without destroying the regional ecological systems. The model of their use of the land is summarised in Figure 1.

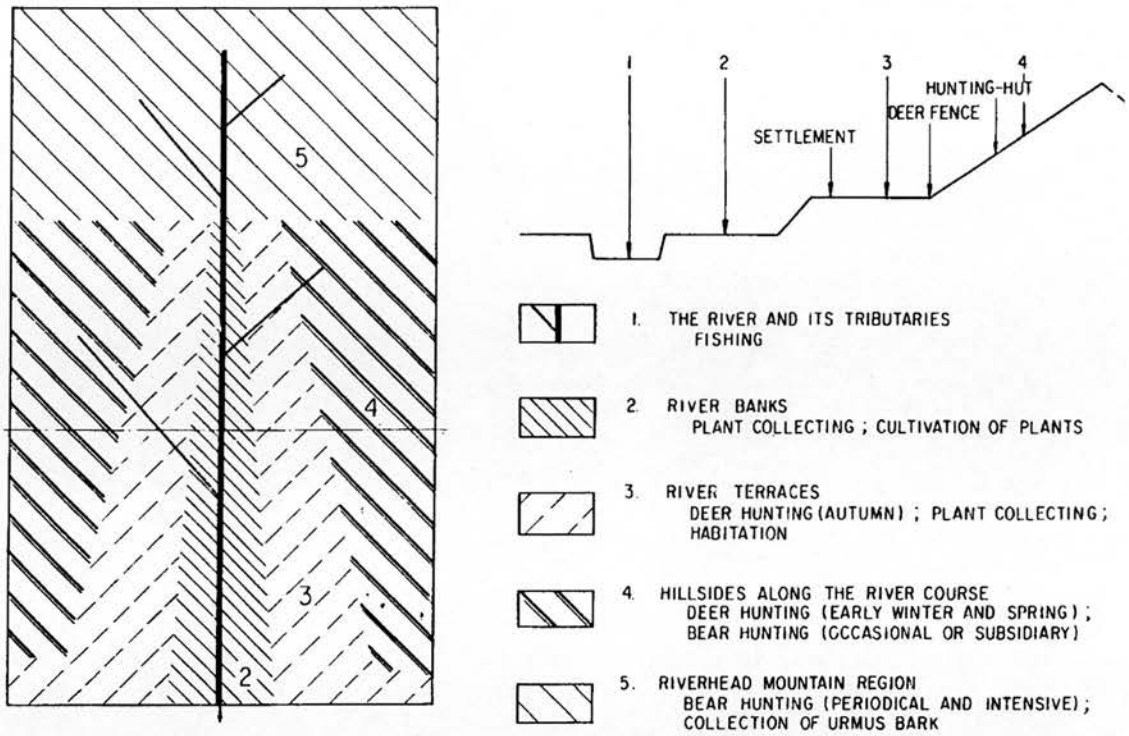


Figure 1: Diagram representing a river valley as the territory of a river group and its ecological zones

Source: Hitoshi Watanabe, The Ainus Ecosystem: Environment and Group Structure (Tokyo: University of Tokyo Press, 1972), p. 58.

The Ainu's territories and land use can be compared directly with the Valley Section described by Geddes, both of which are based on watersheds. In each zone within the Ainu's territories, a particular activity is defined, that could be called "work" in Geddesian terms. Thus develops a sustainable balance between human and ecological activity within a "place-WORK" relationship. Also, their mystical perception of places described in narratives can be categorised as "poesy", which is how appropriate use of land is regulated according to the ecological characteristic of each zone.[7] This combination of the perception and the practical use of places was crucial for sustaining their way of living with nature. At the same time, the example of Hokkaido shows the applicability of the Geddesian theory for analysing the relationship between human activity and places in a regional context.

The regionally based social systems in premodern Hokkaido are also commonly found on the mainland of Japan during the same period. The Japanese philosopher Takuro Kishine claims that the Japanese view of nature is "nature-friendly" and "symbiotic", developed through the abundance of forests and reliance on the local ecosystems, rather than trying to conquer nature. Traditionally, the forests bordering villages are called "satoyama". The word "sato" means "village" and "yama" is

"mountain". As the "village's mountain", the satoyama is part of the village, and is shared by the members of the community for various purposes. The functions of the satoyama can largely be divided into two: the practical and the spiritual. In a practical sense, the satoyama plays the role of supplying fuel, construction materials and compost for cropland. It also was the children's play area, where they passively learned about the regional ecological systems.[8] In a spiritual sense, the ecological systems were also a metaphor for religious transmigration.[9] In Shinto mythology, eight million gods exist anywhere and everywhere in daily life. The Japanese word "yama" or mountain is sometimes synonymous with a sacred place or shrine, because mountains are considered to be connecting points between the earth and the sky.[10] These two senses, the practical and the spiritual, developed a Japanese monistic view of humans and nature. The living places were perceived in terms of mythological and religious language, which implies sustainability of both the regional ecology and the day-to-day lives of the people.[11]

This unique Japanese view of the world can be examined using of the French geographer Augustin Berque's concept of "milieu" derived from the unity of objectivity and subjectivity.[12] The two meanings of the Ainu's regional territories and the Japanese "satoyama" systems characterise the common structure of traditional society. This created unique social systems in both the Ainus' watersheds and the Japanese "satoyama" areas, in a "milieu" condition. This intersubjective perception of the places and the landscape conveyed from the ancestors' experiences through mystical language developed the practical use of land. The method of developing and acquiring knowledge was dominated by experiences and by accumulating narratives because there was no scientific knowledge. But the empirical knowledge, rather than the scientific one, had enabled the perception of the region in terms of ordinary language, developing a strong consensus among the inhabitants of how to live there.

7.1.2 Ainu housing

The Ainu's housing called "shise" is made from the region's wood for the main structure and regional grasses and bamboo to fill the roof and walls. Similar to both traditional Japanese and western architecture, the hearth is at the centre of the house and the fire burned throughout the year because of the harsh climate. However, the closeness of the housing shows that "shise" had the opposite spatial structure to that of traditional Japanese housing that is based on openness. Pictures of a reconstructed "shise" are shown in Figure 2.

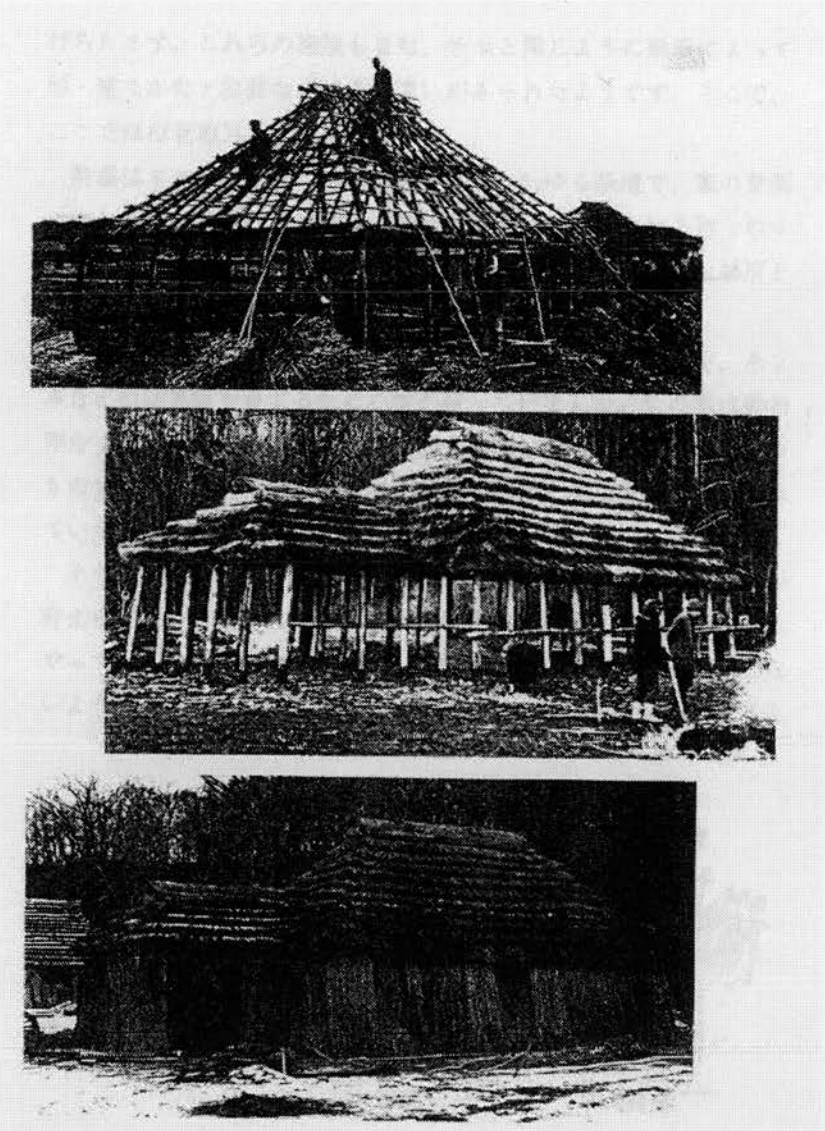


Figure 2: The Ainus' house "shise"

Source: Zaudanhojin Ainu Minzoku Hakubutukan ed, Ainu Bunka no Kisochishiki [A Basic Knowledge of the Ainu 's Culture] (Tokyo: Sofukan, 1993), p. 126..

Despite the primitive materials and construction methods of "shise", a number of studies have shown that Ainu housing is highly energy efficiency. Some of the unique characteristics of "shise" that make them energy efficient have been identified by the Japanese anthropologist Chiwako Usami. The grass walls of "shise" are relatively effective insulators despite the fact that they are not airtight. In winter, the insulation of the outer wall is increased by snow, which prevents energy loss. The only heat comes from the hearth which is set in the centre of the house. The hearth does not melt the insulating snow or heat the air causing a cold draft because the hearth's fire is fairly small. The earthen floor and grass walls are

enough to continuously trap heat radiating from the hearth. As a result, the whole house becomes a radiator, and the heat re-radiates from the floor and the walls to the people within. Although the room temperature is much lower than the temperature of the earthen floor and walls, the sensory temperature, even during the severe winters, is elevated by the radiating heat. This creates, in a unique way, a comfortable indoor environment.[13]

The efficient use of heating energy by radiation is also found in traditional Japanese housing. As mentioned in the previous chapter, "hibachi" were not used to increase the whole indoor temperature, just for keeping the human body warm directly from the small fire.[14] Japanese people had found a way of living with a restricted supply of resources caused by the socio-political conditions in Edo. Although the social and ecological conditions that Edo's citizens faced were different from those of the Ainu, both had ideas for sustaining their physical and spiritual ways of living.

This example shows that there are different types of spatial structure in Japan, because of climatic differences from north to south. The traditional housing developed on the mainland should not be assumed to be the only traditional space. Other unique architectural elements, such as those of the Ainu "shise", should also be considered as significant characteristics of the broader concept of traditional Japanese spaces.[15] In this respect, the "tradition" is no longer categorised in terms of forms and spaces. Instead, the essence of the tradition can be identified in the knowledge gathered to satisfy the individual's physical and spiritual needs in harmony with the local conditions.

7.2 A Critique of discontinuity: The two traditions

The current cultural discontinuity brought about by the Meiji restoration implies a different awareness of nature between the Ainu and the Japanese.[16] If the increasing importation of wood into Hokkaido is rooted in the current Japanese sense of value of forests, the causes of this discontinuity should be examined and ways sought for reviving the traditional awareness of sustainability in the housing industries. In order to identify the transition of the immigrants' attitude in early twentieth century Hokkaido, Tsubetsu — one of the forestry towns of the Central Okhotsk area that was covered in Chapter 5 — will be studied.

7.2.1 Japanese domination in modern Hokkaido: Tsubetsu

The name "Tsubetsu" in the Central Okhotsk area originated in the Ainu word for "waters at the bottom of the mountains". As already mentioned, the Ainu's territories are based on watersheds, and it is common for their names of places to relate to hydrological features. Just as the Ainu name suggests, Tsubetsu is mountainous and forested, and the central area of the town developed at the confluence of the Abashiri and Tsubetsu Rivers. Currently, Tsubetsu's administrative border is defined by the ridge of the mountains, a legacy of the Ainu's definition of territories based on watersheds. Supported by the abundant forest resources, Tsubetsu relies entirely on underground sources for its water supply. This demonstrates, in practical terms, the relationship between the mountains and the residents of Tsubetsu.

The development of Tsubetsu started in 1898 with the government's re-allocation of the land to Japanese people. The population of Tsubetsu, which was less than a hundred Ainu at the end of the nineteenth century, rose to more than 1,500 by 1911, and this figure doubled within three years. Since the immigrants to Tsubetsu came from all over Japan including 38 different prefectures, the initial occupants of the developing town had a variety of historical and cultural backgrounds. Their shared experiences in Tsubetsu developed into an alternative immigrant culture.

The immigrants' memories of that period are described in their own words in the book One Hundred Histories of Tsubetsu.[17] These accounts show the basic attitudes of the immigrants to forests, dominated by their desire to deforest land and conquer nature, revealing reclamation as their main aim when they came to Hokkaido. This attitude is contrasted to the Ainu one of harmonising with nature. The immigrants' development started with them building their own housing, which was no more than huts to provide shelter from the wind, rain, and snow. It is described by one of the immigrants as follows:

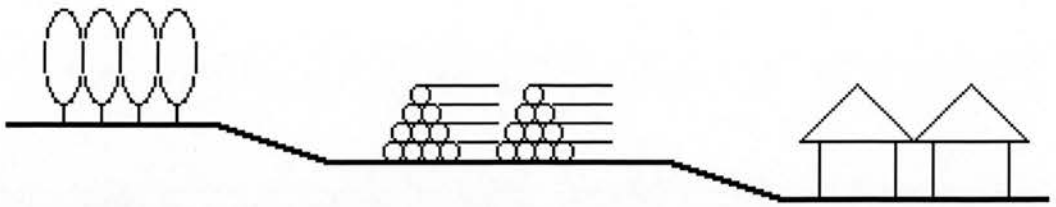
> "I built my hut by felling trees, which grew thickly, and cutting bamboo grass, which was two metres in height. But my next door neighbour was separated from me by overgrown trees, and it was dark even in the daytime. At night, I used to be afraid of scary roaring sounds and felt alone listening to the owls hooting... In snowstorms, snows came into my humble hut from the entrance and even through the gaps in the walls and the roof. And when I got up in the morning, the quilt was covered with snow."[18]

Despite the fact that they used the same materials for building houses as the Japanese, the Ainu could create a more comfortable indoor environment. The housing that was built with traditional Japanese

techniques could not meet their physical needs in the severe climate of Hokkaido. As a result, the Japanese experienced a decline in their standards of living. The Ainu's knowledge had never been applied to their housing, causing a discontinuity in housing techniques.

Their primary work in the land reclamation was to fell trees, cut grass and burn it to develop cropland from the thick forests. In other words, destroying the sustainable ecosystems and replacing them with fields to supply themselves with food, was their primary objective. Trees and forests were just an obstruction rather than a resource or religious symbol. As the demand for wood on the mainland increased, the forests were no longer seen as obstructions, and came to be viewed as one of the major industries of Hokkaido. The immigrants' attitude to wood had shifted from perceiving it as an obstruction to thinking of it as a resource that creates industry and profits. It had shifted from opening the land to creating the industries needed for Hokkaido to sustain itself economically. Thanks to its abundant resources, Tsubetsu increased wood production for the mainland and for the paper industry started in Hokkaido in 1912. This was the trigger for developing the transportation infrastructure in the Tsubetsu area. The conventional transportation of wood by river when the industry was in its early days was replaced with roads and rails constructed as the production increased.

The modern regional development in Hokkaido matches Geddes' "Valley Section", as shown in Figure 3.[19] A number of industrial developments around the river in Tsubetsu show the use of resources and energy that optimise the natural characteristics. Forestry in the uplands of Tsubetsu is followed by wood processing in central Tsubetsu, and the processed wood is transported to the areas of consumption downstream in Central Okhotsk and other areas including the mainland. However, as already mentioned in the previous chapter, this modern "place-WORK" relationship is ending due to the regional environmental and industrial degradation by excessive felling. The Geddesian rational land use in Tsubetsu has also been replaced by the influence of market forces, and wood production in the region has reduced because of the increasing importation of wood.[20]



Forest (Tsubetsu)	**Forestry town (Tsubetsu)**	**City (Kitami)**
Forestry	Wood Processing	Housing construction

Upper area ⟷ Lower area

Figure 3: Valley Section in the Central Okhotsk area

7.2.2 "Familiarity and attachment" to Tsubetsu

In our everyday discourse, the past, itself symbolic, is recalled to us symbolically.

Anthony P. Cohen[21]

Having shown the discontinuity of the individual's attitude to the forests from premodern to modern society, a way of reconstructing a possible social consensus towards an alternative continuity will be sought for Tsubetsu and the Central Okhotsk area. In criticising the current Japanese awareness of nature dominated by visual images, the historical context rooted in Ainu culture, which was analysed earlier in this chapter, will be crucial.

In order to interconnect the individual's perception and the historical context, the concept of "topophilia" will be used. "Topophilia" was proposed by the American geographer Yi-Fu Tuan as the relationship between the physical environment and the individual emotional perception. He expounds the term as follows:

"The word 'topophilia' is a neologism, useful in that it can be defined broadly to include all of the human being's affective ties with the material environment. These differ greatly in intensity,

subtlety, and mode of expression. The response to environment may be primarily aesthetic: it may then vary from the fleeting pleasure one gets from a view to the equally fleeting but far more intense sense of beauty that is suddenly revealed. The response may be tactile, a delight in the feel of air, water, earth. More permanent and less easy to express are feelings that one has towards a place because it is home, the locus of memories, and the means of gaining a livelihood."[22]

In historical contexts, Tuan explains topophilia from the viewpoint of "familiarity" with and "attachment" to the physical environment.

"Awareness of the past is an important element in the love of place. Patriotic rhetoric has always stressed the roots of a people. To enhance loyalty, history is made visible by monuments in the landscape and past battles are recounted in the belief that the blood of heroes sacrificed the soil. Nonliterate peoples can be strongly attached to their home grounds. They may lack the chronological sense of irreversible events characteristic of the modern Western man, but when they try to explain their loyalty to place they either point at the bonds of nurture (the mother-earth theme), or they reach into history."[23]

In Tsubetsu, the Ainu's naming of places reveals that the geographical characteristics are shared with the present day Japanese.[24] Both the Ainu and Japanese cultures are related to nature. The Ainu's spatial hierarchy described in Figure 1 can be superimposed on the current land use and landscape, showing their similarities. The main roads developed across the rivers. In the Ainu's land use, the "riverhead mountain region", where they hunted for bears, corresponds to the forestry area in present day Tsubetsu. Also, the "river banks" used for cultivating plants and the "river terraces" for plant collecting have been used continuously for agricultural purposes. This shows an appreciation shared by the Ainu and the Japanese for the sense of place from the practical use of the land.

In a social context, the relationship between the past and present in the naming of places is explored with a view to creating a consensus: a process that is described by the social anthropologist Anthony P. Cohen as "symbolising the past":

"... the past is being used here as a resource, in a number of ways. The manner in which the past is invoked is strongly indicative of the kinds of circumstance which makes such a 'past-reference' salient. It is a selective construction of the past which resonates with contemporary influences. Sometimes this kind of folk history resembles myth, or meta-history, in the sense which

Malinowski gave to the word: a 'charter' for contemporary action whose legitimacy derives from its very association with the cultural past. Myth confers 'rightness' on a course of action by extending to it the sanctity which enshrouds tradition and lore."[25]

The symbolisation of history is also developed by Geddes in his analysis of The Masque, performed in Edinburgh in 1912. In his book, Dramatisations of History, Geddes described the past not only as the past itself, but also as a potential for creating the future:

"Nor is the field of dramatisation limited to past or present; and thus to expressing such vision as we may have reached. How better arouse, evoke, such vision yet farther? For history is no mere retrospect of the past, nor excavation in it: what it reveals to us above all, is the past still working on within our apparent present."[26]

In his study of drama in Edinburgh, Geddes describes Robert Burn's poet expressions, demonstrating the possibility of social communication to uplift the spirit as a motivation for citizens to pursue practical activities. Geddes' approach, therefore, is to interpret a story of the past, into the art — The Masque. This greatly extends the symbolisation from the personal sense towards creating a common perception of a place, which leads citizens to a feeling a social identity. It does not mean to inform the truth of the region's history, but to make a possible story for fostering a common sense of place among the members of the society.

Although no strong movement for developing regional stories in Tsubetsu and the Central Okhotsk area can be found, the Ainu's mysticism has the potential to foster individuals' attachments to the place in both a spiritual and practical sense. This might combine the current fragmented sense of place towards a common story based on the Ainu's world. For example, Isse Miyano, a Japanese poet who spent his childhood in Tsubetsu, expresses his memory in his anthology Tsubetsu in which he describes the Ainu's naming of places in Tsubetsu.[27] His sense of place is symbolised by the Ainu words that continue from the past to the present. Although there is no evidence that both Miyano and the Ainu share the same impression of the place, his familiarity and attachment to the place is represented by their names. In this respect, the naming of places could be separated from their original Ainu meanings and interpreted within a personal context The Ainu names that remain in the current Tsubetsu, could be a medium for interconnecting the two worlds of the Ainu and the Japanese, and a language for

symbolising the various individual perceptions of the place. The persistence of the Ainu place names demonstrates the possibility that the Japanese did not simply take over the land from the Ainu, but synthesised their sense of the place both through their own experiences and those implied in the Ainu place names.

7.2.3 "Urbanisation and attitude to the countryside" in the Central Okhotsk area

The symbolisation of the past is not only expected to develop to a consensus among the residents, but could also be extended to the visitors' perception of the place. In terms of Tuan's topophilia, this relationship can be explained by another factor: "urbanisation and attitude to the countryside". The urban residents' spiritual needs for relaxation and recreation are satisfied by making contact with nature and its simplicity, escaping the complexities of the city. But this "nature" is not the real nature without any human intervention, but instead indicates the "countryside" as the artificial nature created by agricultural activity. Tuan asserts that:

> "The countryside is widely accepted as the antithesis of the city irrespective of the actual living conditions of these two environments. Writers, moralists, politicians, and even social scientists still tend to view the rural-urban spectrum as a fundamental dichotomy. Yet, from another perspective it is clear that raw nature or wilderness, and not the countryside, stand at the opposite pole of the totally man-made city. The countryside is the 'middle landscape' (Leo Marx's term). In the agrarian myth it is the ideal middle world of man poised between the polarities of city and wilderness."[28]

The landscape of Tsubetsu discussed here is not the real nature found in "wilderness", but a part of the quasi-nature of the "countryside" as the place for people to develop their sense of the man-nature equilibrium. When the human activities that shape the landscape are sustainable in harmony with the regional ecology, they are creating the conditions required for economic, social and ecological sustainability. This evokes the concept of milieu: the unity of objectivity and subjectivity. However, the reality of Tsubetsu's landscape planning is a man-made city filled with regional wooden products and a superficially unified housing design. What is missing is the inevitability of human activities in a particular natural environment. As shown in Chapter 5, the situation of having forestry-related industries governed by economic rationality manifests itself symbolically in the Tsubetsu landscape in

which visitors cannot perceive the existence of milieu.

In this current situation, symbolising the past as expounded by Cohen would provide the opportunity for uniting the fragmented comprehension of the place into a common understanding. One of the possibilities could be sought in the place names marked by the Ainu's use of land and by more appropriate land use beyond the rivers that stimulates the imagination. The concentration of these man-nature relationships would be information both residents and visitors could use to perceive a milieu. In this respect, the sociologist, Richard Jenkins's claim supports Cohen's argument:

> "Symbolisations of community are umbrellas under which diversity can flourish, masks behind which a considerable degree of heterogeneity is possible. In my terms, the mask or umbrella can be conceptualised as a nominal identification. This is always symbolised in language, but also potentially in other forms, whether visual, musical, or whatever. The practice and experience of community membership, vis-à-vis other members and outsiders, is the virtual dimension of community identification: it may, in large degree, be individually idiosyncratic. Both nominal and virtual have internal and external moments of identification: each is a dialectic of group identification and social categorisation."[29]

The landscape of the countryside may make visitors feel topophilic. However, the commercialism that regional industries are trying to bring to the area would fail to satisfying the visitors' needs for relaxation and recreation. The visitors' separation cannot be kept within the same "umbrella", resulting in a loss of regional identity as well as the visitors' attachment to the place. Since each visitor and each resident seeks different needs in the same place, it would be difficult to reach a consensus at a practical level. But according to Jenkins, identity is symbolised in language, creating a virtual dimension of community identification from different values. The symbolisation indicates one of the directions that the regional identification will seek in the future. In the case of Tsubetsu, the Ainu's land use and their naming could make the residents aware of a sustainable way of living and the history of regional industries. The Ainu's land use and their naming also help to convince visitors that they are in an ideal world of man-nature equilibrium, represented visually by the landscape.

7.3 "Dreams" towards an alternative continuity

An alternative approach to reconstructing forest-related industries can be sought in reviving the continuity from premodern to post-modern Hokkaido. The Ainu's social system, which has already been mentioned, could be a model for creating a sustainable society. But this does not mean an acceptance of the Ainu's primitive knowledge, replacing the conventional ideology and socio-political systems. Instead, the aim is to discover the essence of their physically and metaphysically sustainable way of living in harmony with nature that is in common with that of present day society. A common umbrella for both the residents and the visitors can be sought in identifying this essence in the current Central Okhotsk area.

7.3.1 Forest-side-type industrial cities project in the Central Okhotsk area

In Japan, tertiary industries play a significant role in revitalising the depressed forestry-related industries. Currently, they no longer compete economically with imported wood, and are not financially viable.[30] Instead, they have to find alternative ways of surviving without completely relying on conventional values, and have to seek alternative ones for making more profits using the forests.

The forest-side-type industrial city project, started in 1988, has been run for ten years by the Department of Forestry of the Hokkaido government. With the current depopulation and lack of labour in the forestry towns, the regional government has been conscious of the multi-dimensional use of forests by developing alternative regional industries that optimise the natural resources. The basic idea of the project is to create a regional relationship between the forests and the towns, beyond the administrative areas, and to develop awareness of the practical relationship based on the watershed areas.

The objectives of the forest-side-cities project are summarised as follows:

1. Establishing a better relationship between people and forests
2. Developing local industries to sustain the forests
3. Characterising the local society in an international context[31]

Three different directions are set in the project from the objectives above, each of which leads to an

alternative "added-benefit" for the forests: environmental, productive and cultural. They show that forests are no longer defined narrowly within the modern industrial sense; their potential should be explored in order to revitalise the regional economy by creating various industrial activities. To promote the project, three model areas — the Tokachi, the Central Okhotsk and the North Kamikawa areas were selected because of their abundance of natural resources. In each area, one of the three added-benefits and directions for development are chosen according to its geographical characteristics. The relationship among the directions, the added-benefits and the model areas are summarised in Table 1.[32]

Directions for devepments	Added-benefits	Model areas
Lifestyle	Environment	Tokachi
Green villages High technology industry park	Recreation	
Industries	Production	Central Okhotsk
Wood production and processing	The regional production	
Culture	Culture	North Kamikawa
Tourism Arts and crafts	Environmental Education	

Table 1: Outline of the forest-side-type industrial city project

Sources: Kankyo Sekkei, "Rin Shinrin Gata Sangyo Toshi" Keisei Chosa Hokokusyo: Mori to Kyoseisuru Seikatsu Bunka Ken to Sangyo no Sosyutsu [A Planning Report for "Forest Side-Type-Cities"] (1992).

In the case of the Central Okhotsk area, the conventional industries of forestry, wood processing and housing construction from the upstream to downstream have been broadened. The industrial structure in Tsubetsu has shifted from the primary industry of forestry and the secondary industry of wood processing, to the tertiary industries of leisure, recreation and tourism. Craft making is also playing a role in supplying souvenirs made of wood. Currently, the major industries of Tsubetsu are the tertiary ones, whose share of the whole Tsubetsu industries is 43.1% compared to 25.8% for the primary industries and 31.1% for the secondary industries.[33] This shows that Tsubetsu is no longer a forestry town, but could be said to be a tourist town. Figure 4 shows the changing structure of the modern industries towards the current tertiary industries.

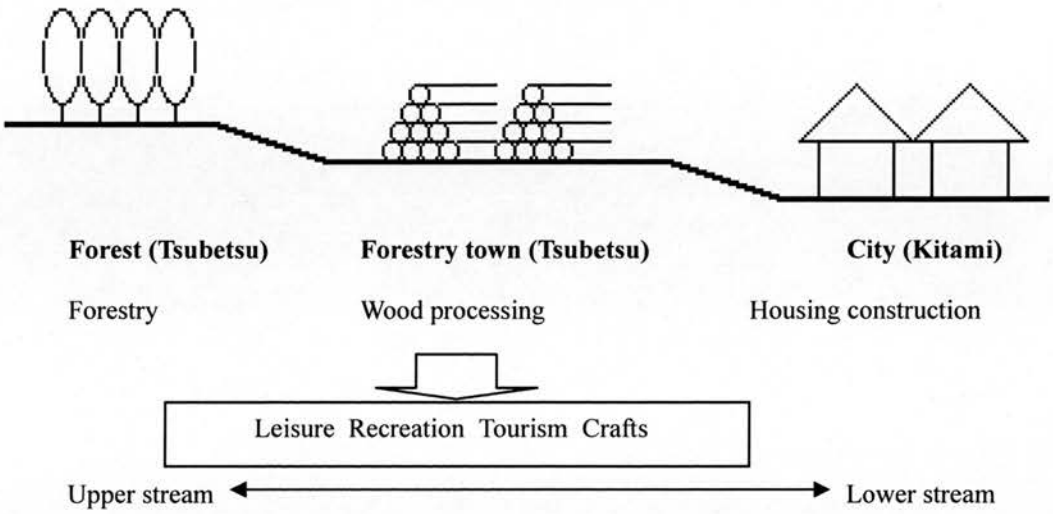


Figure 4: Valley Section in the Central Okhotsk area

7.3.2 The upstream area: Creating an alternative sense of value for the forests

The current Tsubetsu HOPE project explained in Chapter 5 has contributed to making the whole town a huge showcase for the region's wooden products. Yet it has failed to provide the visitors with any sense of the relationship between man and nature in the regional industries. This means that there has been no consensus in the residents' and visitors' feelings, sense and experience of the place, both the town and the land. However, if the town is to be sustained as a forestry town as well as a tourist attraction, it is crucial that it satisfy both the residents' and the visitors' needs. The former could be achieved by creating various job opportunities by optimising the forests in a sustainable way, and the latter by providing visitors with opportunities for recreation and relaxation that are separate from daily life in urban areas.

Tsubetsu, as the regional wood market between the upstream and the downstream, could be the first step for visitors to develop their awareness of the regional industries beyond mere leisure activities. As far as housing construction within the region is concerned, it could be said that an alternative role for the upstream area would be to present visitors with visual evidence of the production process from the production of wood upstream to the consumption of it at the downstream end, taking place in an

ecological sustainable manner all within the Hokkaido region.

Ironically, one of the main examples of the attempt to promote visitor awareness of regional forests is found in Tokyo, where the wood consumed in housing construction greatly exceeds the regional supply. The "Group for Building Housing of Tokyo Wood" was started in 1996 by various members of the forestry industry, wood processing factories, architects, builders, and clients in Tokyo and its surrounding area. The number of current members is about eighty. As their name suggests, the objective of this group is to promote housing construction using regional wood. Tokyo is based on the watershed of the Tama River, and the group has been developing along the length of the river the relationship between the upstream supply of materials and the downstream of wooden housing construction. According to the information provided by the group, their mission is summarised in the following three points:

1. To create healthy and durable housing using natural materials and builders' skills
2. To use wood as a recyclable natural resource by developing communication between the up- and downstream, which fosters forests in the Tokyo area, preserves the environment, and brings regional wood to Tokyo
3. To participate in face-to-face relationships with people involved in forestry, wood processing, architecture, construction and with clients, to create housing together[34]

In the process of building their own housing, the clients — as members of the group — are invited to the forest that the group owns, in order to see the forestry work for themselves, as shown in Figure 5. They also have the opportunity to visit houses built with Tokyo wood. Through these activities, clients develop their consciousness of the interconnection between their daily lives and nature, as well as their awareness of human activity in the region. Moreover, they are made aware that housing construction is supported by a network of many people working in various industries in the region. Some examples of the housing are shown in Figure 6.

Figure 5: Members of the "Group for Building Housing of Tokyo Wood" visiting the forest in Tokyo

Source: The group's homepage: http://www.forest.gr.jp/

Figure 6: Examples of the housing built with Tokyo wood promoted by the group

Source: The group's homepage: http://www.forest.gr.jp/

In fact, it is no longer possible for the wood in Tokyo which requires a higher woodland maintenance cost to compete with imported mass produced and processed wood from the international market. The first steps for forestry in Tokyo are therefore to separate itself from its conventional meaning of simply being another material product, and to engender alternative values that create cultural, educational, and leisure activities. Takuji Hanyu, one of the founders of the group, asserts that:

> "If Japanese forests and forestry are argued in terms of the conventional monetary and economic values upon which political decisions are made, they will have no future. When the national consensus is based on various sets of values such as historical, cultural, environmental, educational and regional values, wider viewpoints and a long-term thinking, we can envision a future for the

forests and forestry… What are the most important points for us in relation to the forests and forestry? First, for us to be able to accept different values, and second, to increase the number of people who understand the reality of forests and forestry, and support them."[35]

As his argument indicates, the forests will be seen anew by each individual who perceives them. The group aims to offer more people various ways of being interested in forests and forestry by participating in practical activities. Some of the visitors are more interested in learning the practical process from wood production to consumption, and others more concerned with health issues relating to the environment. Yet others participate only as a kind of leisure activity or expect to relieve the stresses of their daily lives. Whatever their reasons, their interests show what the needs of current urbanites are, and what additional values regional forests have. These multidimensional opportunities for experiencing the forests could be in common with the traditional satoyama culture that conveys, both consciously and unconsciously, the relationship between man and nature. But the visitors' participation in forestry work is fundamentally different from this premodern sense. Although their opportunities to gain experience increases, they are not engaged in the real work that contributes to the production, but only quasi-experiences of forestry. Visitors are not expected to be part of the labour force, but to be the supporters of Japanese forestry. The primary industrial activities are transformed into a part of the tertiary sector, in which each visitor can have an opportunity to develop a personal sense of value about the forests. Their awareness is expected to extend from a pursuit of relaxation and recreation to housing construction within the regional network up- and downstream. This understanding of the regional industries could lead to an alternative familiarity and attachment to the forests, and could supersede the cost benefit analysis in the choice of housing material. For the producers, this diffusion of the alternative sense of the forests benefits the demand for wood in Tokyo, thus contributing to securing the economic sustainability of forestry-related industries. In such a way, this group is demonstrating the possibility of how forestry can be sustained in the region, while being independent of the global market.

The other difference between the traditional satoyama system and the Ainu's bioregionalism is the balance of the demand and supply of materials in the region. In the traditional society, the regional ecosystems must support the sustainability of the all the residents. In the case of Tokyo, since wooden housing demands greatly exceed the regional material supply because of the centralised population, the network of the up- and downstream areas cannot support the whole region's demand. Consequently, the

regional material supply based on the watershed is not always apparent, and applies only to a limited number of people. The regional material supply is only one of the various ways of constructing wooden housing. But this small number of supporters of regional forestry is vitally important for the small businesses of the upstream area.

The creation of the network of the up- and downstream areas implemented for Tokyo's forestry would be more significant in the Central Okhotsk area of Hokkaido, where there is sufficient natural resources to satisfy the total housing demand of the whole region. If visitors are to remain separate from the place of production as envisaged in the Tsubetsu HOPE project, communication and mutual understanding will not be reached between the producers and visitors as potential consumers. By watching wood cut in the forests, people can learn the importance of using natural resources efficiently, and can appreciate the importance of planting new trees in order to sustain an ecological cycle. It would also be one of the approaches used to redirect the consumers' criteria for choosing products, away from images created by the media and towards a greater consciousness of the real process involved in the production of the regional resource. In Tuan's words, it would foster "familiarity and attachment" for both the producers and the consumers. This topophilia implies a sense of man as living in harmony with nature, as well as the various human networks in the region. In this sense, building a wooden house of regional wood means the reconstruction of the story of wood production from the upstream to the downstream areas. The sustainability of Japanese forestry relies on creating, as much as possible, stories of the regional wood. However, the premise that a common story exists in the region cannot be supported because the variety of the perceptions that visitors have of the forests and forestry are not always those supposed by the producers. As Hanyu suggests, the producers would therefore be required to accept different values enabling each visitor to create a unique story based on their own experiences. When housing is understood as the story constructed by the region's upstream-downstream relationship, the client will discover loftier and more varied values and attachments than the client would have done as a naïve consumer of a product.

7.3.3 Downstream: Communication and co-operation

In contrast to the upstream's contribution of creating a consensus about the significance of the regional forests and forestry, it could be argued that the role of the downstream area, where a large number of wooden houses are constructed, is more practical. In Kitami, as an example of the

downstream area, wooden housing has been constructed based on the abundant supply of resources from the upstream areas. The renaissance of the process within the region, from the supply of materials to housing construction, is one of the objectives in the Central Okhotsk for dealing with the previously mentioned crisis in the region's forestry and increasing wood importation.[36]

Traditionally, the wood processing factories in this area are small and have been running their own independent businesses, seeking to make profits for themselves. They are struggling with the overwhelming effects of imported wood and the resulting decline in the regional industries, without co-operating with each other in their attempts to deal with the current crisis. With this in mind, the forest-side-type industrial cities project focused on fostering a sense of community among the small factories by satisfying their common needs. In 1996 the "Okhotsk Wood Plaza", the information centre for the regional forest industries and products, was opened in Kitami and has been contributing to more efficient supply of materials to meet demand. Although no identifiable results have been achieved since its opening, the Plaza is providing a forum in which issues common to the different regional industries are discussed. The aim is to create a more co-operative relationship to strengthen the whole region's industries.

The Plaza has been holding meetings to solve the current regional economic problems by changing the isolationist attitudes of the region's companies. According to Jiro Oishi, the director of the Plaza, the main points of the meetings can be summed up as follows:

1. Efficient material supply: strengthening the relationship between the wood processing factories and the housing's builders

   In the Central Okhotsk area, it takes around twenty days from the time the materials are ordered to the time they are shipped because it takes time to dry the wood and the amount stored in each factory is limited. They therefore cannot always provide the specified amount of materials in the period required by the house builders. This has been recognised as one of the obstructions in developing market share.

   The Plaza proposes a more effective material supply by controlling all the whole stock in the area under one roof, so that the shipping period can be shortened. Meetings that included the builders revealed the size and amount of material they required. More flexible and efficient ways of supplying the materials at lower prices are being sought by participants at the meetings.

2. Efficient use of the natural resources: developing a new factory

According to Takanori Arima of Tokyo University, only 63% of each log is used for main products, with 25% being usable elsewhere. Of that 25%, only one third is used in construction, and more than half is used as fuel.[37] In this area, wood sawed from logs is only 60% of the whole volume, and the rest of the material is used for various purposes such as crafts, paper production and fuel for drying wood. But none of them makes large profit supporting the industry itself.

Currently, glued laminate wood is starting to be used all over Japan in order to more efficiently use the small parts and to make more profits.[38] But the construction of a factory to produce the laminate wood, not only requires a large initial investment, but also crucially needs a sufficient and constant supply of material from the sawing factories. At present, the Plaza's role is to promote the construction of a factory of this kind in the area. A reasonable price is being sought for the small wood pieces from the sawing factories and for the factory itself. By negotiation with the parties involved, a co-operative system with efficient use of regional resources is being sought.

3. Creating job opportunities in the region

To sustain the region socio-politically and economically, job opportunities for workers must be secured. The increase in imported wood and automation designed to improve production efficiency has deprived local workers of opportunities. As a result, many of the residents have had to leave the area in search of alternative jobs, thus reducing the region's demand for housing which itself affects the housing industry. The pursuit of production efficiency without exploring the amount to be produced not only causes job losses, but also weakens the sense of community. As a result, residents will not feel a need for the region's resources and products, and will tend to choose products based purely on cost rather than on any attachment to the region.

The weakening attachment to the region also influences other local industries that support house construction. In the conventional housing construction in the area, doors and windows are custom made by skilled craftsmen to fit each house. However, the increasing domination of machine production and prefabricated parts means that the factory-made products have replaced these traditional skills. This trend is not only seen in the imported housing construction such as 2x4 housing, but has also infiltrated almost every housing construction project.

Faced with these problems, the Plaza is committed to creating job opportunities by promoting the construction of a new factory. It is also supporting traditional skills in house construction as part of the regional activities. Although no practical way of promoting these skills has been determined, housing construction must be one of the catalysts for revitalising the socio-economic cycle of the region.[39]

The Plaza creates an opportunity to identify common difficulties in the region among the various industries. The issues that are identified will make each of industries reflect on the separatist attitudes they have in pursuit of profits, and will make them realise that they cannot continue this way in the long term. By developing co-operation between the factories and the builders, all the region's industries are

able to provide the products and services required by consumers. In other words, each company can make profits by seeking common interests in the region.

Even if the regional industries decided to pursue cost reduction to compete with imported wood and large-scale house builders in the global market, they could not be expected to win. Such a strategy would only accelerate the community's disintegration. They should compete not in terms of cost but in terms of the quality of the service. Products with a long lifespan such as housing require maintenance and repair over the course of the owner's life. Satisfying this demand would be one of the ways of sustaining the craftsmen and smaller construction companies. This community-based approach would foster a sense of community rather than distracting attention from it, developing it as their core competence.

7.3.4 An alternative housing design derived from the Ainu's knowledge

As already mentioned, high insulation and airtight technology exist in Hokkaido. However, it is ironic that this technology has contributed to the spread of 2x4 housing in which the application of this technology is easier and more efficient. As a result, it has separated housing construction from the regional forestry. The concept of this technology also differs fundamentally from the Ainu's way of living in the severe climate of Hokkaido. The high insulation and airtight technology maintains a stable indoor environment by separating the interior from the outdoor environment. But the resources needed for heating and cooling still rely on oil, gas and electricity. On the other hand, recent research on "shise", the Ainu housing, revealed that they use heat from the ground that is kept stable throughout the year. According to Chiwako Usami, an architectural engineer, this idea can be applied to the current housing in order to control the indoor environment more efficiently. In summer, the hot indoor air can be cooled by the ground, and in winter it can warm the cooler air. The air circulates throughout the house to keep the living environment stable without relying on fossil fuels any more than necessary. The mechanism for this air-conditioning system using the ground's heat is shown in Figure 7.

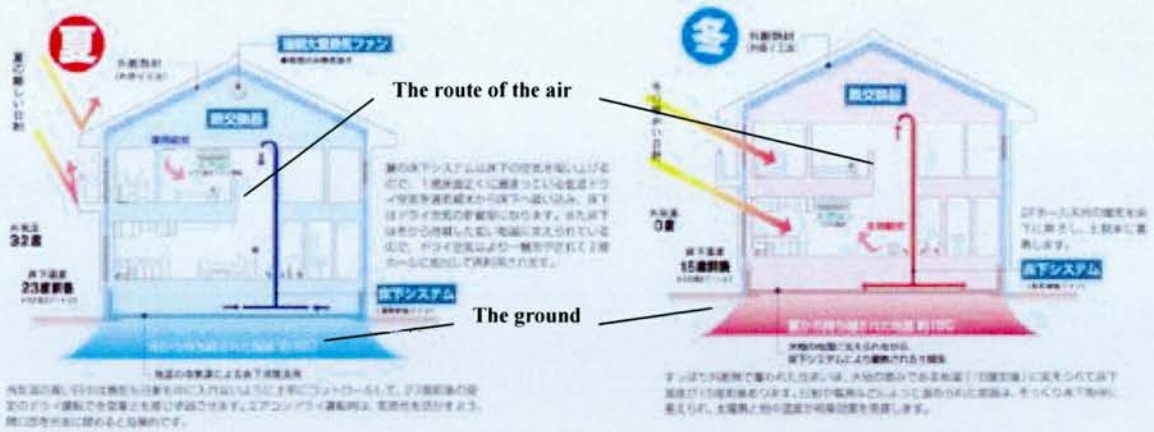


Figure 7: Mechanism of the air conditioning system using the ground's heat

Source: http://inpaku-www.chuden.co.jp/data_base/database_h/h_39.html

This example shows that the empirical knowledge used in the Ainu housing has not been consigned to the past, but is an idea that is still applicable for improving current ways of living. The basic idea from the past is reexamined in terms of current scientific knowledge, and the sophisticated system is then applied to current housing. There have been about four hundreds houses with this system built in Chiba prefecture near Tokyo. But it is not generally known that this technology originated in Hokkaido. The Ainu's knowledge is only used as one of many technologies employed to improve energy efficiency, so the Ainu's contribution is never understood in terms of its cultural context. The Ainu's knowledge is used in the technology, but its cultural background is not recognised. Also, the materials and technology cannot be identified as having a relationship with regional ecological activities.

What has been argued in terms of continuity in this chapter is not the pursuit of maximum economic and energy efficiency. The technologies that are supposed to have a significant role for solving the current environmental issues have their own limitations in that they function only for present problems. They cannot be applied to the other issues, and might even cause new ones. To seek more comprehensive solutions to the environmental issues, a strategy is required for symbolising various values within the common historical context. The Ainu's culture, as has been shown in this chapter, could be a possible language for interconnecting the past and the present. Although the air-conditioning system based on the Ainu's knowledge may not be necessary in Hokkaido in the way it once was, it could have a significant part in constructing cultural continuity. In the traditional Ainu society, it

functioned as a means of sustaining their way of life as well as the regional ecology within the closed systems of the island of Hokkaido. At the same time, reconstructing an alternative closed cycle of housing supply in Hokkaido should be considered. What is in common between both the past and the present is the fact that the region's society and economy are sustainable only in harmony with the local ecology. The Ainu culture could play a role in transforming this fact into a common story for the region. Ainu culture could be used to create an "umbrella", such as that symbolised by Geddes in his presentation of the past as the driving force for creating a modern society.

A sustainable housing design does not reveal itself by surveying passive historical facts or by applying more effective and efficient technologies. In other words, a history separated from the present must be transformed into a story originating in the past and linked to the present. Various small approaches to sustainability that have taken place from the upstream to downstream should be reinterpreted and brought into the historical narrative so that the region can affirm its identity. The Ainu culture is one of the possible languages for creating this story. In the current situation in which the region's industrial economy cannot be optimistic, this approach would probably be the only way of securing of the regional economy's autonomous position within the global market. For the forestry workers and the house builders, the story will foster a sense of pride that cannot be acquired through practical approaches. For consumers, the story presents an opportunity to be conscious of the region's activities as they relate to their own lives.

---

1 Takako Yamada, Ainu no Sekaikan: "Kotoba" kara Yomu Shizen to Ucyu [Ainu's View of the World: Nature and Cosmos Read From the Language] (Tokyo: Kodansya Sensyo Mechie, 1994), pp. 66-73.

2 Takako Yamada, Ainu no Sekaikan: "Kotoba" kara Yomu Shizen to Ucyu [Ainu's View of the World: Nature and Cosmos Read From the Language], pp. 66-73.

3 Christian Norberg-Schulz, Genius Loci: Towards a Phenomenology of Architecture (New York: Rizzoli, 1979), p. 23.

4 Christian Norberg-Schulz, Genius Loci: Towards a Phenomenology of Architecture, pp. 23-32.

5 Takako Yamada, Ainu no Sekaikan: "Kotoba" kara Yomu Shizen to Ucyu [Ainu's View of the World: Nature and Cosmos Read From the Language], pp. 228-30.

6 Hitoshi Watanabe, The Ainu Ecosystem: Environment and Group Structure (Tokyo: University of Tokyo Press, 1972), pp. 56-68.

7 See: Chapter 2.

8 Satoshi Sugawara, Toi Hayashi Chikai Mori: Shinrin Kan no Hensen to Bunmei [How Close Are People to Forests? Civilisation and Changes in the Perceptions of Forests] (Tokyo: Aichi Syuppan, 1995), pp. 7-14.

9 Satoshi Sugawara, Toi Hayashi Chikai Mori: Shinrin Kan no Hensen to Bunmei [How Close Are People to Forests? Civilisation and Changes in the Perceptions of Forests], pp. 145-9.

10 Kazuo Matsubayashi, "Spirit of Place: The Modern Relevance of an Ancient Concept", in The Power of Place and Human Environment, ed. by James A. Swan (Bath: Gateway Books, 1993), pp.

335-6.

11 Takuro Kishine, Mori to Bunmei [Forest and Civilisation] (Tokyo: Sun mark Syuppan, 1996), pp. 41-50. As already mentioned in Chapter 1, the institutional framework of traditional society was created and sustained in terms of mythology, as the ordinary language, which was intersubjectively shared among the members of society.

12 Augustin Berque, Fudo toshiteno Chikyu [Médiance] (Tokyo: Chikuma Syobo, 1994), pp. 43-5.

13 Chiwako Usami, "Ainu Dento Kaoku 'Shise' ni yoru 'Sumaikata' no Chie" [The Ainu's Wisdom of How to Live in "Shise": the Ainu's Traditional Dwelling], in Bessatsu Takarajima EX Ainu no Hon (1993), pp. 70-3.

14 See: Chapter 6.

15 See: Asakawa, Shigeo, "Mofutatsu no 'Nippon Kukan': Minamishima to Hokkaido Ainu jukyo Saiko", in Kenchiku Zasshi [The Other Two "Japanese Spaces": Reconsidering Dwelling of Minami Islanders and Hokkaido's Ainu] (May 1993), pp. 34-5.

16 See: Chapter 5.

17 Tsubetsu Hyakunen Shi Hensan Iinkai, Tsubetsu Cho Hyakunenshi [One Hundred Histories of Tsubetsu], pp. 4-7.

18 Tsubetsu Hyakunen Shi Hensan Iinkai, Tsubetsu Cho Hyakunenshi [One Hundred Histories of Tsubetsu], p. 7.

19 See: Chapter 5.

20 See: Chapter 5.

21 Anthony P. Cohen, The Symbolic Construction of Community (London: Routledge, 1985), p. 101.

22 Yi-Fu Tuan, Topophilia: A Study of Environmental Perception, Attitudes, and Values (New York: Columbia University Press, 1974), pp. 93.

23 Yi-Fu Tuan, Topophilia: A Study of Environmental Perception, Attitudes, and Values, p. 99.

24 See Tsubetsu Hyakunen Shi Hensan Iinkai, Tsubetsu Cho Hyakunenshi [One Hundred Histories of Tsubetsu], pp. 4-7. For example, the following Ainu names in Tsubetsu have geographical meanings:

Tatsumi: the place with one isolated mountain.
Kakkumi: the place where the people scooped water with ladles made of white birch.
Kitoi: the land abundant in grasses.

25 Anthony P. Cohen, The Symbolic Construction of Community, p. 99.

26 Patrick Geddes, Dramatisations of History: The Masque of Ancient Learning and Its Many Meanings (Edinburgh: Patrick Geddes and Colleagues, 1923), iv.

27 Isse Miyano, Shisyu Tsubetsu [Tsubetsu Anthology] (Tokyo: France Do, 1995).

28 Yi-Fu Tuan, Topophilia: A Study of Environmental Perception, Attitudes, and Values, p. 109.

29 Richard Jenkins, Social Identity (London: Routledge, 1996), p. 111.

30 See: Chapter 4.

31 See: Kankyo Sekkei, "Rin Shinrin Gata Sangyo Toshi" Keisei Chosa Hokokusyo: Mori to Kyoseisuru Seikatsu Bunka Ken to Sangyo no Sosyutsu [A Planning Report for "Forest Side-Type-Cities"] (1992).

32 See: Kankyo Sekkei, "Rin Shinrin Gata Sangyo Toshi" Keisei Chosa Hokokusyo: Mori to Kyoseisuru Seikatsu Bunka Ken to Sangyo no Sosyutsu [A Planning Report for "Forest Side-Type-Cities"].

33 Toyo Kezai Shinposha, Chiiki Keizai Soran 2001 [Regional Economies 2001] (Tokyo: Toyo Kezai Shinposya, 2001).

34 See: http://www.hkr.or.jp/home/forest

35 See: Hanyu, Takuji, Ringyo ni Tazusawaru Hitori toshite " Tokyo no Ki de Ie wo Tsukuru Kai" ni Kitaisurukoto [What I Expect of the "Group for Creating Housing of Tokyo Wood " as One of The Forestry Industries] (1998).

36 Hokkaido, 21 Seiki wo Ninau Hokkaido no Shinrin Sakutei Project [A Forest Project in Hokkaido For The Twenty First Century], p. 62.

The Hokkaido Government proposes a framework of regional forestry from the production of resources to the processing and distribution, which will make the material supply more efficient and effective.

37 The 40th Anniversary Conference of the JWRS (Tokyo: April, 1995), p. 494.

38 Also see: The 40th Anniversary Conference of the JWRS (Tokyo: April, 1995), p. 494. According to Takanori Arima, only 63% of each log is used for main products, with 25% being usable elsewhere. Of that 25%, only one third is used in construction, and more than half is used as fuel, emitting CO_2 in the air. CO_2 emission from producing sawing wood is 2.5 kgC/m^3, and that of blued lamination wood is 17.0 kgC/m^3, which is nearly seven time as much as that of sawing wood.

39 Interview with Jiro Oishi at the Okhotsk Wood Plaza in July 1997.

CHAPTER 8:
Conclusion: "Deeds"
Towards An Alternative Design Process

This whole study has been based upon the hypothetical definition of sustainability in architecture as set out in Chapter 1 and applied as a framework for a critical approach towards the region in Chapter 2. The two case studies in Japanese houses, in Tokyo and Hokkaido, explored in Chapters 3 to 7, explored alternative design processes based on the different human requirements in each region. In the final chapter, the study will return from the in-depth analysis of these specific regional contexts to the more general question of the relationship between house design and the regional environment, concluding the present inquiry into the notion of sustainability.

8.1 Reconstructing the Notation of Life

8.1.1 Consensus-making: an alternative role for narratives

There are three different angles from which one can view the current state of housing in Japan. The first is the users' position, which consists of a two aspects: images derived from the media and the desire to satisfy personal needs. These images are more important in defining the users' position than their own objective understanding of reality, thus pushing the users solely towards the pursuit of their own selfish desires. The second viewpoint is that of the housing industry, which prioritises exclusive decision-making on the part of the users above its own economic sustainability. Furthermore, economic concerns are prioritised over questions of ecological sustainability on a global scale through the excessive consumption of energy and resources. The third viewpoint is that of the government, which, in attempting to come to terms with the conflicting pressures of the economy and the environment, has come up with a superficial solution to the environmental issues raised by promoting a uniform technological approach to increasing energy efficiency in houses for the whole of Japan. As a result, traditional houses and their commensurate quality of life are being gradually replaced by new accommodation with higher standards of living through a deliberate policy of scrap-and-build.[1]

Just as Lyotard defines the postmodern condition as one of "paralogy", so these various ambitions

pertaining to different groups of people exist discretely within the same society, without any attempt to seek a consensus between them. It could be said that the current state of Japanese house design has arisen by default, as a consequence of each group pursuing its goals without regard to the others. There has been no consensus around creating houses as culture.[2] Ecologists are trying to change the status quo by revealing the impact of the policy of scrap-and-build on the natural world and the global environment. However, this alternative viewpoint will never influence the existing disjointed relationship between users, industry and the government, unless the current economic rationale behind decision-making is in some way delegitimised. Moreover, unless as a society we liberate ourselves from the power of media advertising to develop an independent awareness of our environment and thus realise that we can no longer continue to sustain our present lifestyles through the excessive consumption of energy and resources, no fundamental change in behaviour will be achieved.

Nevertheless, there are some indications that people are starting to seek a society in harmony with the global environment. A growing number of consumers are choosing environmentally friendly products for ideological reasons, and community-based initiatives for tackling environmental issues have been developed in many places. However, such behaviour is still restricted to particular areas and to particular communities within Japan. Rather than trying to raise awareness of the abstract issues surrounding the global environment, modifying attitudes towards day-to-day living is being looked towards increasingly as a more important way of instigating change. For example, in urban residential areas such as Central Tokyo, residents feel that their security is being jeopardized by rising levels of crime. In the event of emergencies such as fires or earthquakes, mutual aid for helping each other does not function properly, thus increasing one of the residents' biggest fears. In particular, the earthquake, which occurred in the Hanshin and Awaji areas in 1995, increased awareness not only amongst the communities affected but also in Japan as a whole of the need for properly functioning relationships within a given neighbourhood. In other words, only by sustaining community links can survival needs be met in such an event. Another example can been seen in the small towns and villages in the mountains in Hokkaido, where young people, on whom the future prosperity of the regional industries is seen to depend, see few prospects for themselves in the region and have been moving out in order to seek new job opportunities in urban areas. This trend is threatening the economic and social sustainability of the region. At the same time, the growing number of old people in these areas is

becoming a burden on local authorities, for whom it is becoming extremely difficult to provide adequate welfare and medical services. In facing these issues, the revitalisation of the regional industries and their future sustainability are crucial in socio-political terms.

In these examples, the feelings and experiences of the individuals living and working in society make paramount the need for sustainable communities. However, this notion of sustainability appears to bear little relationship to the concept of ecological sustainability as demanded by environmentalists. But Geddes' Notation of Life, as explained in Chapter 2, can be seen as functioning not only for rebuilding quality of life, but also for connecting it to the concept of ecology through the process of "Acts", "Facts" and "Dreams". In the example of Minami house in Tokyo, explored in Chapter 6, the family did not choose a traditional wooden house as their home for conservative reasons. In his family, as in contemporary society as a whole, the conventional qualities of traditional Japanese houses are no longer a priority. Rather, his primary concern was for the sentimental value of the old house in which his parents had lived and for the way in which living in the house had structured his family's sense of identity: this concern can be defined as representing the first two stages, "Acts" and "Facts". These concerns led to the decision to restore and extend the house, corresponding to the development of "poesy" in the subsequent "Dreams" stage.[3] Thus, the users' perception of reality can lead to a re-evaluation of the style of the traditional house, as a consequence of the convergence of values.

On the other hand, the builders of the Minami house had different decision-making priorities in the design process. They appreciated the way in which the restoration of the house opened up an opportunity for them to make full use of their skills and techniques. Their sense of pride in Japanese tradition and their experience of rooting house-building firmly within the "Facts" stage of the Notation of Life both supported their decision to take on the project in order to make best use of their skills. This stage is categorised as "design" in the "Dreams" stage. Although both the users and the builders had a perception of the house which differed greatly from the traditional concept, the restoration of a traditional house can be seen as a manifestation of their different "Dreams" — for the users, the perpetuation of the legacy of their parents within the house and for the builders, the maintenance of traditional skills and techniques. Thus adopting the style of a traditional house provided a common means to satisfy different ends. The process of house design from the perspective of the users and the builders as summarised in the Notation of Life is shown in Figure 1.

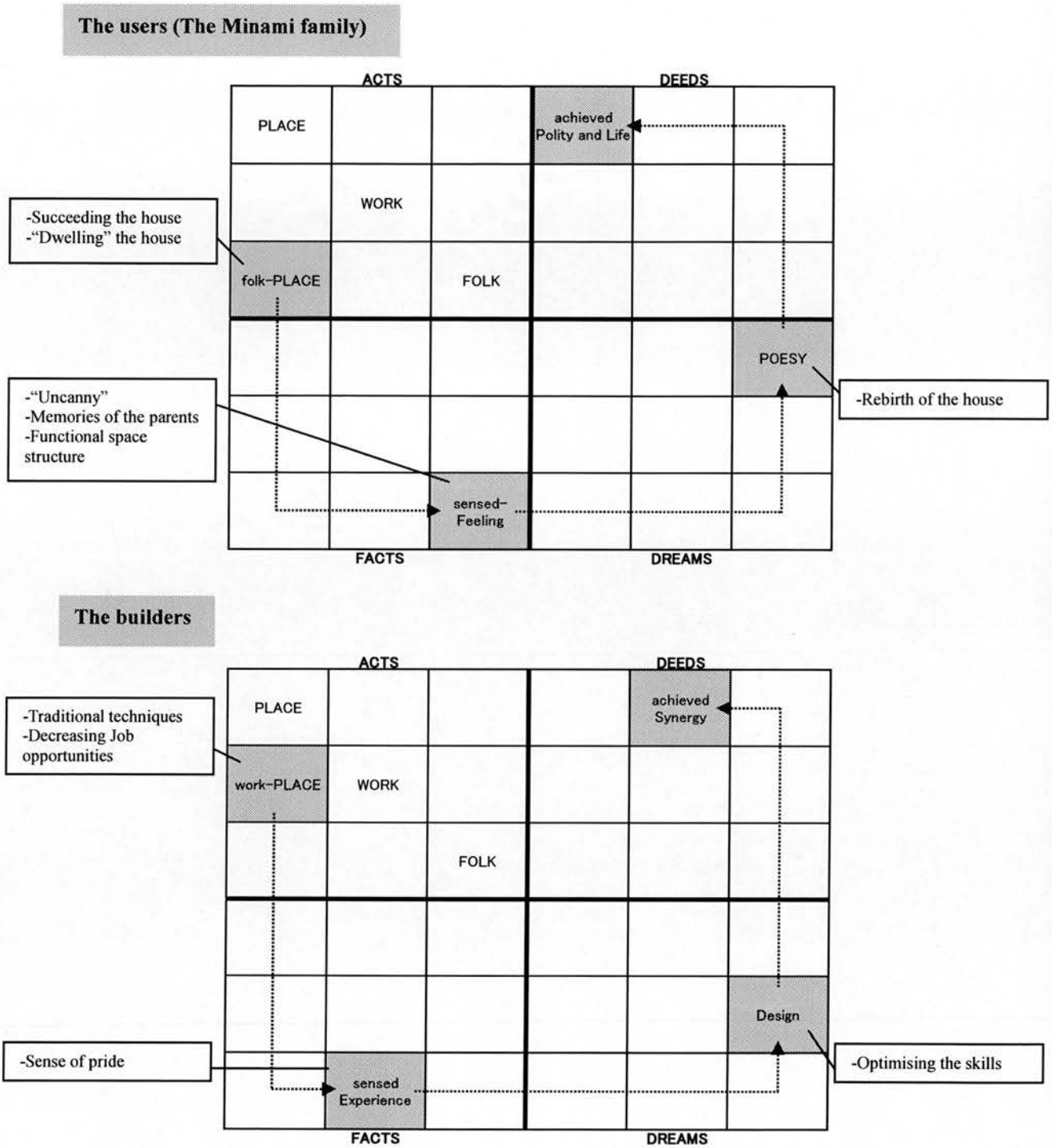


Figure 1: The relationship of "creation" in the Notation of Life

(The users and the builders)

It might appear obvious that neither approach towards house design is primarily motivated by ecological concerns i.e. the quest for an alternative lifestyle in harmony with nature. Yet users are free to reach a personal understanding of ecology in attempting to develop a comfortable way of living in high-density urban areas without relying too much on new technologies that risk perpetuating problems acting as an obstacle towards creating a harmonious residential environment. Furthermore, employing builders' skills to get the most out of wood should extend the lifespan of houses, thereby contributing to reducing the number of homes which have to be demolished. Thus whilst still centred on the pursuit of personal goals, both the users' and the builders' approaches contain an ecological dimension.

In the case of Hokkaido, the argument for a single form of house-building is strengthened by the prevalence of available timber, forestry and its related manufactories being the main industry in the mountain towns and villages. The collective perception of forestry in the region among workers dates from a period when wood production was at its height and the local economy at its most prosperous following on from the development of Hokkaido by the forestry industry at the end of the nineteenth century. Despite the importance of forestry to the region, the industry pursued a policy of excessive felling, which resulted in the reduction of regional resources. Since then, the increase in the quantity of cheaper imported wood with an adverse effect on the regional industries has raised awareness amongst workers of the crisis facing the regional industries and the local economy. This crisis has in turn resulted in migration out of the area: this factor together with the deep–rooted disenchantment with conventional forest-related industries are categorised as "Facts" in the process of the Notation of Life, resulting in turn in the development of tourism as an alternative industry, targeting visitors from urban areas. The development of an alternative industry in the region is not the only way in which the diversification of forests and forestry in the area are helping the region to support itself: wooden houses, which make use of regional wood, are also being promoted. This trend has been identified as an attempt to find an alternative form of "design" by the regional construction industry and positioned in the "Dreams" stage in Tsubetsu and the Central Okhotsk area.

Visitors to these rural areas, who mostly come from urban centres, seek opportunities for relaxation and recreation. The way in which the forest-related industries are being redeveloped provides them with opportunities to participate in forestry work, fostering better relations between the upstream and downstream areas.[4] This interaction between wood producers and visitors has generated a shared

attachment to the forests, identified as an alternative "Fact". A better understanding of the true value of wood liberates these city dwellers from depending uniquely on information provided about wood and wooden houses by advertisers. In addition, the Ainu's worldview and the practical knowledge they have derived from living in the area, which tourists have observed, may also strengthen consumer awareness about the fragile balance between man and nature in the region. This awareness-raising stage might then be followed by the "Dreams" stage, which might in turn orientate individual consumers towards regional wood when choosing the materials with which to build their homes. These processes of the Notation of Life in Hokkaido are shown in Figure 2.

In this example, global environmental issues are once again not the primary concern. But since the regional industries rely on the microenvironment of the forests in the region, ecological sustainability goes hand-in-hand with the protection of the region's society and industry. The Ainu's attitude towards nature reveals the way in which day-to-day life has long been bound up with the regional environment in Hokkaido. Land use has long been determined by natural factors, as indeed it still is today. It is from the basis of this practical understanding of the implications of sustainability that a new environmental awareness will emerge in the region.

In the two examples above, the Notation of Life has been re-defined as a way of reconstructing an alternative narrative in order to create better living and working environments. According to the conventional wisdom of house design, scientific knowledge, as represented here by dominant economic concerns, attempts to orientate consumers' value-based choices in a single direction. This causes endless conflicts between economists pursuing goals based on economic thinking and environmentalists looking to achieve equilibrium between man and nature, as shown in Figure 3. In order to maximise profits houses are advertised by demonstrating how fully they meet the consumers' desires for comfort and value for money. But what the negative Notation of Life revealed in Chapter 5 is that the housing market only satisfies the selfish desires of individuals without in turn helping to construct a shared value-system based on society and the family. Ecologists criticise the current situation on different grounds. Each of the two competing forms of scientific knowledge as they pertain to the two groups fashion a separate narrative of the way individuals live in order to achieve their own goals. As a result the two sides present to the public two separate images of housing and ensuing lifestyles.

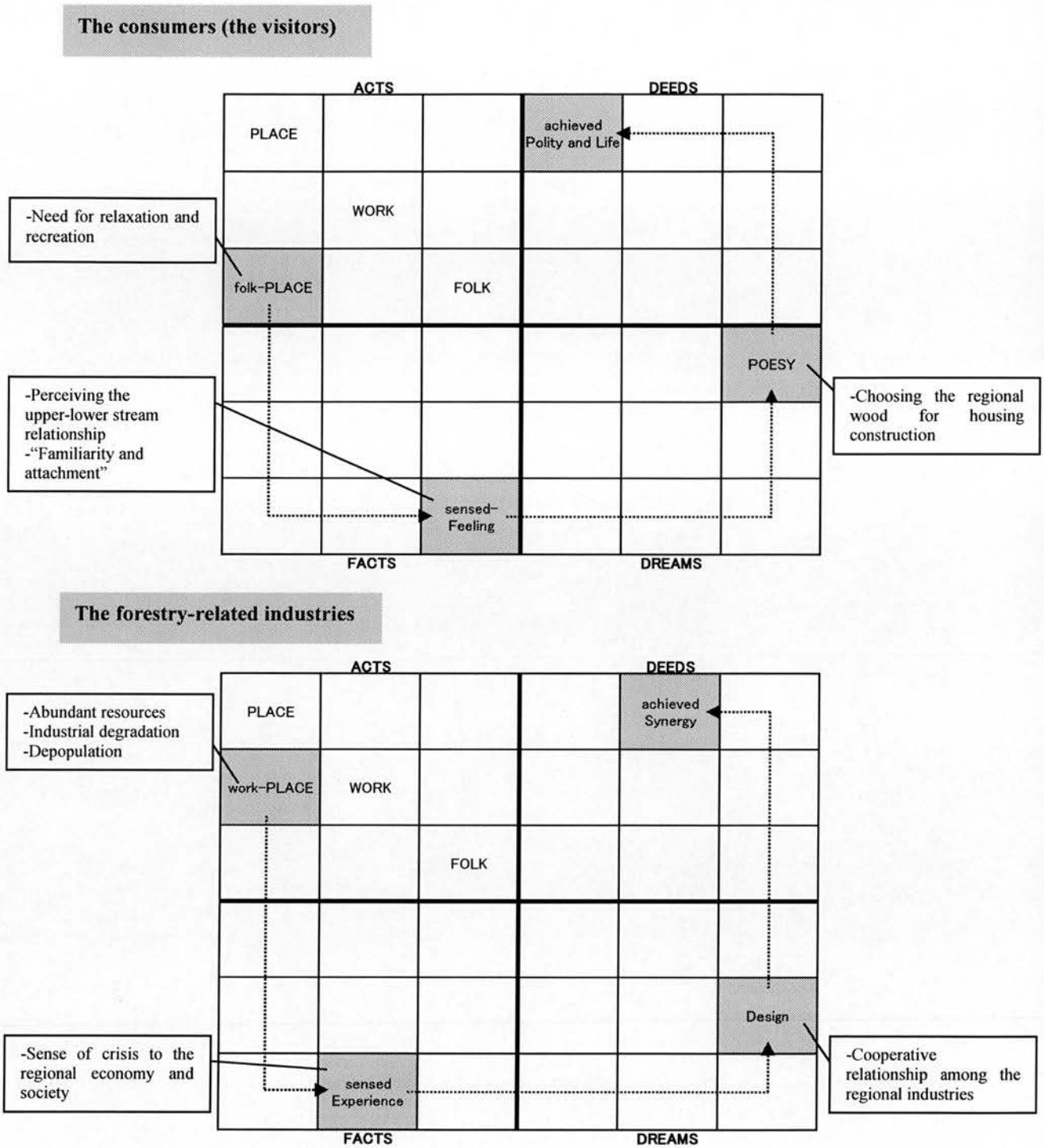


Figure 2: The relationship between the positive and the negative processes in the Notation of Life (Central Okhotsk)

(The consumers and the forest-related industries)

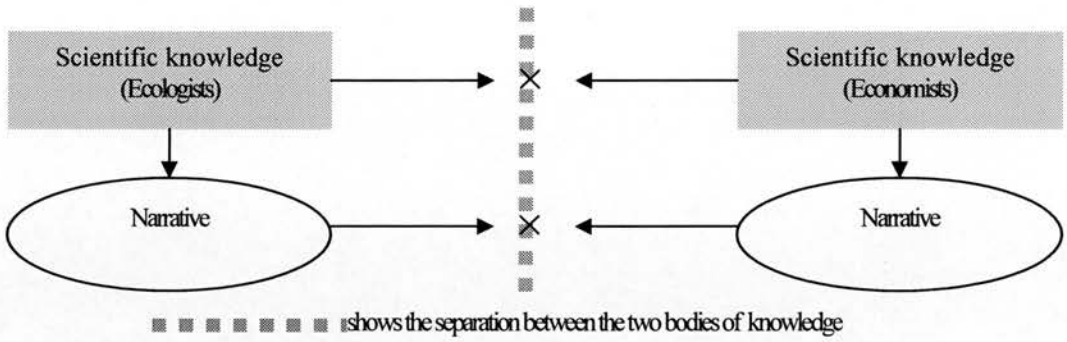


Figure 3: The conventional relationship between the two bodies of scientific knowledge and their resultant narratives

As Figure 4 demonstrates, it might be possible to unite the two competing narratives in a common discourse that consumers would accept. But since both forms of scientific knowledge set out to shape society in accordance with their principles, a superficial merger of this type would only serve as a veil behind which each group would continue to try and exert its will over consumers by dominating the new narrative. Consumers' perception of environmental issues is not always empirically derived. In some cases their understanding of environmental issues is developed through narrative knowledge and it may well be that it is this latter form of awareness which reveals to consumers the conflicting intentions of the proponents of the two forms of knowledge. For example, individuals may become aware of environmental degradation thanks to visual images of the damage caused to nature by human activity that solicit an emotional response. However, this emotional response is manipulated by advertising in order to increase the market for "eco-friendly" products, which appease the concerns raised by such imagery. Thus the narrative is wrested from the hands of ecologists and placed at the service of the economists. Similarly, the promotion through advertising of energy efficient housing is pushing consumers towards scrap-and-build and actually increasing energy consumption because of the requirements of the construction industry. In addition, one consequence of the public desire to protect the environment in Japan is that more and more wood is being imported at the expense of forests abroad. This example demonstrates how a particular ideologically-motivated action may have unexpected and even negative consequences.

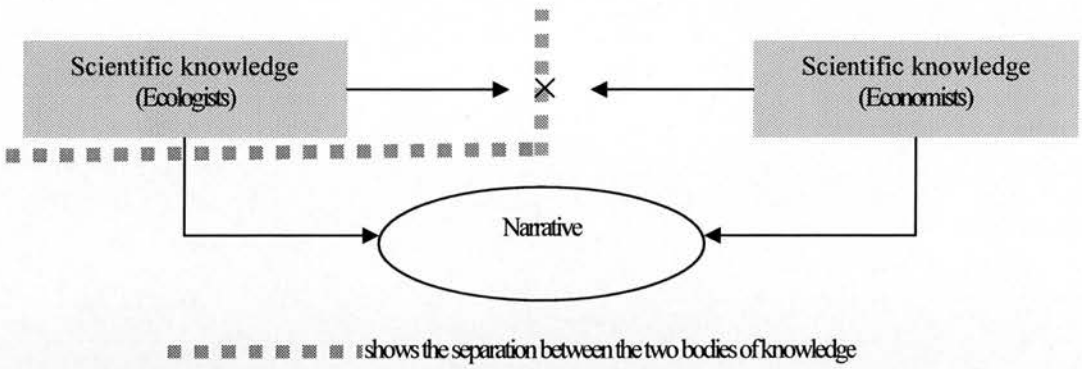


Figure 4: The convergence of the two bodies of scientific knowledge in a common narrative

What we must therefore aim to do is to rearticulate the factors that govern house design in ordinary language instead of in scientific terms. In so doing the public will be liberated from the constraints imposed by the dominant narratives in the media and empowered to develop an autonomous understanding of these factors. This is the alternative structure, as shown in Figure 5, and which could help to resolve the battle between the economic and ecological approaches. As we have already seen in the two examples of the Notation of Life in Tokyo and Hokkaido, new directions for houses in the two regions have been developed through amassing individual "senses", "feelings" and "experiences", a process which enables users and consumers to contribute to the development of alternative narratives for each house.[5] In this way, the opportunities for individuals to impose their own values on house construction are being increased.

Proponents of each of the two bodies of scientific knowledge should shift from taking the initiative in housing design to assessing the feasibility of the various schemes from an economic or ecological perspective. If both of the two competing approaches are able to find evidence that their particular concerns have been respected in each new project then they will be starting to move positively towards a better mutual understanding. If the conventional rationale of each of the two groups is broadened then they could find themselves working towards a common goal. Economists may find that products that are truly in tune with the desires of consumers have an added value. Ecologists may discover a higher quality of life in harmony with nature. Thus narrative knowledge may provide a way to build bridges between the two competing bodies of scientific knowledge providing space for each of them to redefine its purpose.

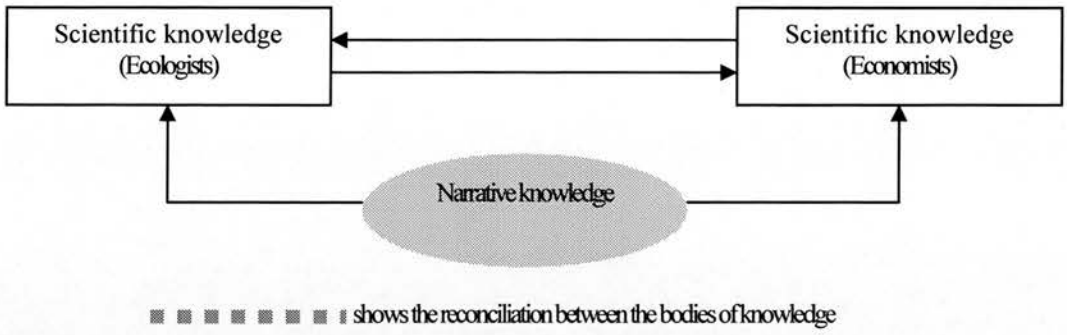


Figure 5: Working towards a possible reconciliation between the two bodies of scientific knowledge through narrative knowledge

8.1.2 Grounding narratives: an alternative role for the design process

Having discussed the various models of the relationship between the bodies of scientific and narrative knowledge, one question remains unsolved – how can different groups of people develop a consensus that secures both the physical and psychological needs of individuals and the societal needs of business? This consensus must also meet the stipulations of the proposed horizontal-vertical communications structure, as presented in Chapter 1.[6]

As far as houses are concerned, each design process consists of the summation of the various attitudes of the different groups in question, as shown in the two examples of the application of the Notation of Life for the users and the builders in Tokyo in Figure 1 and for the consumers and industries in Hokkaido in Figure 2. The consensus on the basis of which new houses are constructed emerges from the encounter between different value-systems. Figure 6 is a summarised model of the house design process as it occurred in the two examples. In the middle of the figure are two parallel diagrams of the Notation of Life. They show the design processes as employed by the two different groups — the clients i.e. the intended users in the case of the detached house, and the material suppliers and builders. The design and construction of a house is regulated by a contractual agreement between clients and builders. This agreement is however temporary and is terminated on completion of the house. It can therefore be called a "temporal agreement" covering the period of construction and laying down the financial terms. Since each group defines its purpose in different terms, there is no need to develop a shared set of values. Once the building has been completed and the contract is terminated there is no guarantee that the users will continue to maintain the building as those who built it envisaged and it could well be demolished

long before it has reached the end of its life because of changing user needs.

If clients and builders share a common set of values as a result of having used the Notation of Life to develop the design process, then this simple agreement will represent a greater level of consensus between them than a mere economic contract. In a horizontal relationship, i.e. that which exists between a single group of people — either the clients or the builders — it is relatively easy to find common ground since people live or work together already. People will strive to find a solution to problems through communication and co-operation. This is what happened between family members in the case of the Minami house and between the various forest-related industries in the Hokkaido region as they embarked on the process of reconstruction together. The house design process can also bring together people who profess a variety of values through the development of vertical relationships, examples of which include the relationship between the builders and the clients in the reconstruction of the Minami house and between the upstream and downstream areas in the forest-related industries in the activities of the group dedicated to promoting the use of regional wood in house building in Tokyo. These examples show how the lines of communication can be opened and expanded through the practical activities of house-building.

However, the emergence of a consensus is far from automatic in every design process. In order for the different value-systems to merge in a single process, the two parallel processes of the Notation of Life, as espoused by the users and the builders respectively, should be reinforced by intercalating them with other narratives. As shown in the figure, one of these is categorised as the "grand narrative", rooted in a historical context and operating over time. The examples of the culture of traditional Japanese houses in Tokyo and the Ainu's worldview in Hokkaido both demonstrate how history is not locked in the past but is a narrative constantly rewritten in the light of the present. Furthermore, the way in which contemporary society positions itself in respect of the future also determines how the past is narrated as it searches for a historical justification for the direction that society has taken. It is not just those involved in a building project who engage in the creation of the grand narrative: academics also have a part to play. According to Cohen, history is the "invention of tradition" and historians therefore have a key role to play in finding solutions to contemporary dilemmas through their investigation of the past. Furthermore anthropology also has a contribution to make, in this instance as a generator of a "model of reality"; through modelling, the rediscovered past achieves a symbolic value which exists

independently of time and space, allowing us not only to engage in a comparison between the way we live now and how we used to live but also to consider what constitutes an ideal society.[7] Cohen claims:

> "Symbols of the "past", mythically infused with timelessness... attain particular effectiveness during periods of intensive social change when communities have to drop their heaviest cultural anchors in order to resist the currents of transformation."[8]

For example, historians have uncovered the aesthetics of traditional Japanese houses and re-evaluated them in the context of the current socio-cultural climate, thereby identifying how the quality of life has depreciated. Anthropologists provide a framework in drawing parallels between the existence of autonomous individuals under the feudal system and the constraints imposed by restricted resources in the Edo period.[9] Although the contemporary socio-economic context is completely different from any which existed in the past, an individual's appreciation of the essence of historical values is timeless and applicable to modern living. Also, in the case of the Ainu, the way in which in the past they based their use of the land on the location of watersheds and developed unique building techniques using regionally available materials may be urging their descendants to reflect on how they can create a greater degree of local sustainability. The attitude of the Ainu towards the natural world, as enshrined in their language and mystical beliefs, is yet another argument in favour of preserving their heritage, since it could be used to help revitalise the region today.[10]

The second narrative shown in the figure is the "local inter-personal narrative", which is centred around the idea of consensus-building in order to bind the community together on a day-to-day basis. An example of this is the reconstruction of the regional forest-related industries in Hokkaido. In contrast to the way in which the grand narrative persuades people to reflect on society in the light of the past, the local inter-personal narrative encourages people to reflect on how the regional ecology, economy and society have suffered from the exclusively profit-seeking activities of industry. In facing up to the increasing domination of the global market, the regional industries should follow a sustainable path by turning what could be seen as the region's disadvantages to their advantage by developing distinctive products and services. By making the small and specific needs of the local community its core business, the regional industries can become self-supporting. Thus the needs of the regional economy in terms of supply and demand can be met without recourse to or competition from the global market.

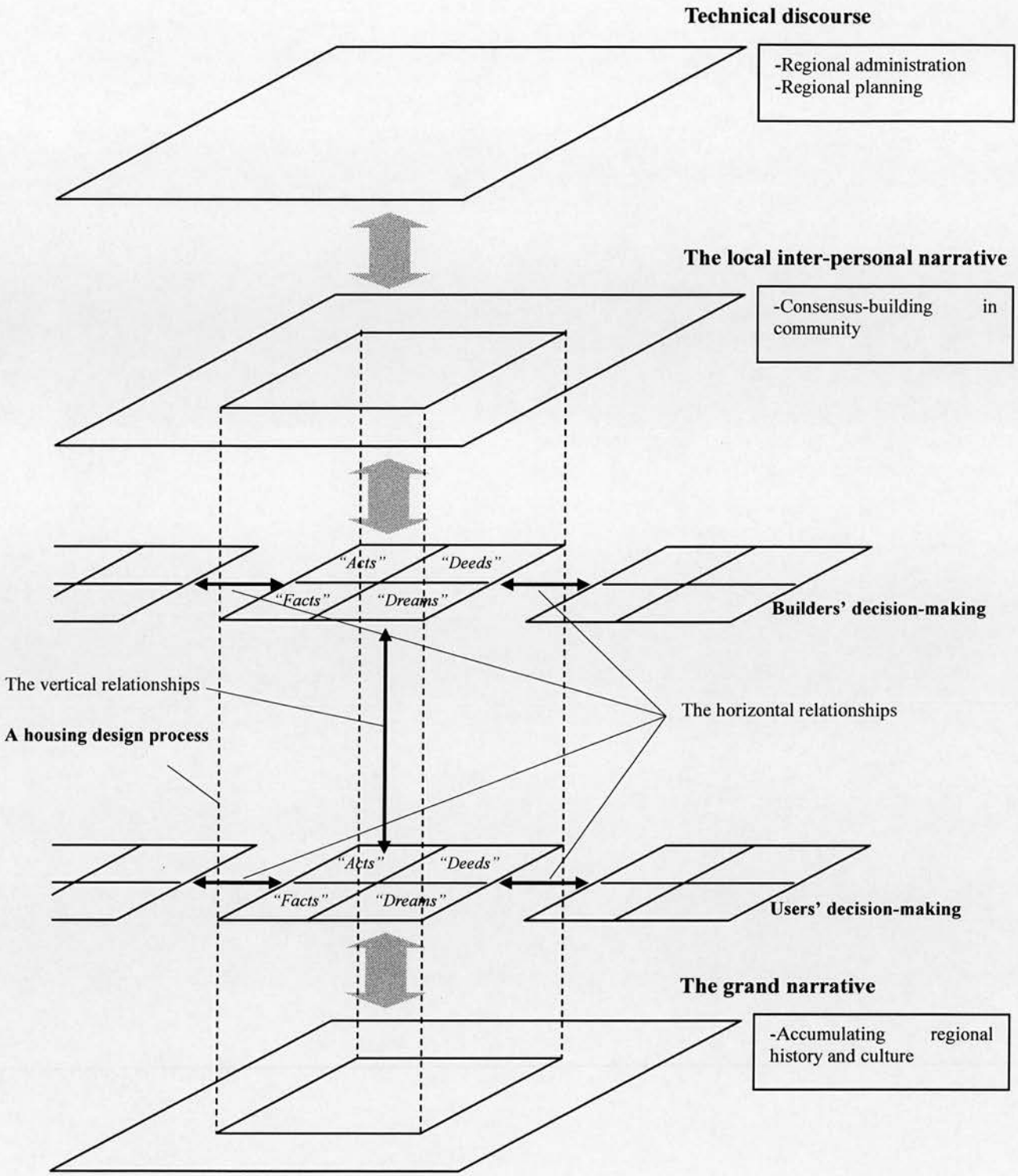


Figure 6: The structure of house design

The narratives described above are narratives developed through daily life; alongside runs another official narrative, the technical discourse of the government, which seeks to administrate the country by identifying problems to be solved and by planning the most appropriate and rational solutions in a professional manner. The decision-making process embodied by this discourse is not however

necessarily consistent with the *modus operandi* of the other two narratives. The predominant role assigned in society to this technical discourse and its supreme rationality often makes it difficult to evaluate the potential contribution of subjective personal narratives to defining the quality of life. Insofar as it considers individual desires it tends to do so in isolation from any notion of society and this approach has obvious consequences for regional and ecological sustainability. The limitations of technical discourse were seen in the negative processes of the Notation of Life shown in Chapter 5.

Criticising the technical discourse does not imply a desire to replace it with narrative knowledge in making policy. Policy-making must be approached in a professional manner and remains a "black box" for individuals. However, it is important for individuals not to be entirely subordinated to the dominating power of professionalism and to rediscover ways in which they can re-establish independent value-judgements and an autonomous role in society. Individuals must be empowered, in the context of the design process, to challenge government policy. In this way the grand and local inter-personal narratives will act as the vehicles for the sum of all the individual value-systems thus integrating them into a corpus of narrative knowledge that can be shared in the community. Once the standoff between any given community and the government is transformed into co-operation through the emergence of a common vision, a project for a house informed by the updated Notation of Life can impact on the political decision-making process, as a narrative broad enough to guide the region towards sustainability materialises.

8.1.3 Project orientation: an additional role for architects and planners

The house design process structure and its extension in political decision-making as described above do not occur automatically; reconstruction must begin by opening up channels of communication between producers and users, the lead for which must come from the design process. In the case of Minami house in Tokyo, it was Minami himself who, as the user of the house, initiated a constructive dialogue between himself and the builders. In the case of Hokkaido, it was Oish in the Okhotsk Wood Plaza who coordinated meetings with the aim of setting in motion the reconstruction process for the region's industries.[11] These leaders were motivated by their awareness of the realities of life and work in particular places and the related issues; they also understood how theses issues slotted into grand narratives rooted in Japanese tradition and local inter-personal narratives of regional needs.

However, it goes without saying that the situation of the users does not always put them in a position

to provide viable leadership because they do not always have access to enough information to comprehend the issues fully. Despite the fact that they may well possess a high level of personal awareness of the problems, they may not have enough influence or expert knowledge to alter a conventional process. In order to empower users in the context of the house design process, architects must take the lead. This is where the role of architects as mediators between users and builders comes into play. Through their vertical relationship, users and builders participate in the same design process whilst independently working towards their own ends. In order for a project to satisfy both their needs, architects must manage its direction carefully. For example, the materials chosen for the construction of houses must not only satisfy the practical requirements of the users, but must also help to secure job local opportunities, which in turn contribute towards the socio-political sustainability of a whole region. Architects must take an overview when making decisions and they have a responsibility to inform users about the nature of local industry from a professional perspective. This does not imply that architects should seek to impose their own values and decision-making process on users. It simply allows users to make more informed decisions rather than having their desires dictated by the media. This process can be deemed a success if the users come to share a common vision with the builders who are charged with the practical side of the project. In this context, the architects might also play a part in choosing suitable builders for the users. Furthermore, architects can also act to convey the builders' understanding of the issues to the users and thus help to create the necessary consensus. Thus the role of architects is not confined to the practical aspects of house design; they also have a role to play in forging narratives on the part of the users and the builders and drawing them together into the same project.

As already mentioned, each small design project is reinforced by the two narratives: the grand and the local inter-personal. Architects promoting small projects must put their knowledge and experience to best use in order to help forge these narratives. This concern for narrative is not however the exclusive domain of architects. In the case of grand narratives, historians "inventing traditions" and anthropologists "modelling" them can both work to support architects from an academic perspective. In addition, in the case of inter-personal narratives, architects can collaborate with regional industry in order to design houses that are appropriate to the area, thus working towards a practical consensus.

Thus, the prior existence of a regional consensus need not be a given. Even the place of history and traditional culture in the region may need to be re-assessed in order to adapt them to the modern world.

What is expected of architects in the Notation of Life is, above all, to construct a common narrative of house design for both users and builders, developing a basis for a consensus based on a shared value-system. They should also contribute to the establishment of a regional consensus in extending the new narrative to apply on a regional level. The new consensus is not however permanent. Its effect is cyclic; the regional consensus influences further narratives in new projects for individual houses, which in turn generate a re-evaluation of the regional narrative. Through this process of continual interaction between specific and broader more general narratives, the consensus will grow and mature. This endless interactive cycle and the position of architects within it are shown in Figure 7.

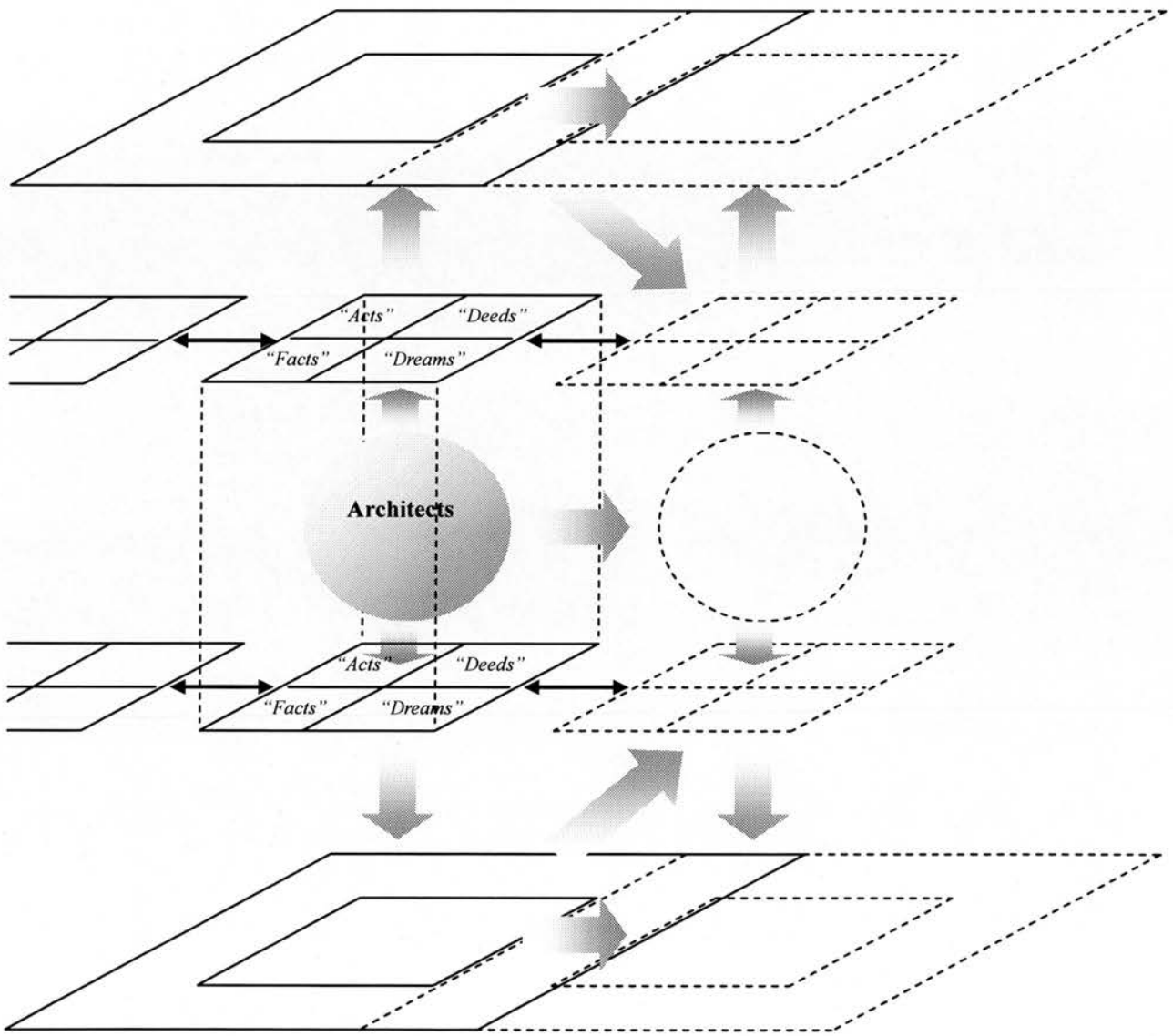


Figure 7 The position of architects within the house design process

8.2 Towards sustainable house design

8.2.1 Towards a synthesis of art and science: sustainable house design

Having set out above how sustainable house design might operate it is now time to define exactly what this might mean. Sustainability will arise neither from a compromise between economic and ecological concerns, nor from the promotion of arbitrarily defined eco-friendly lifestyles. It must emerge from a spiritual understanding on the part of the users and the builders of what constitutes quality of life, an understanding that then informs the practicalities of the design process. This understanding is not limited to the satisfaction of personal needs alone; it must also be developed in the context of other people's activities and spiritual needs. Working together, grand and local inter-personal narratives should, on a regional scale, work to secure overall spiritual sustainability. As we saw in Chapter 1, a structural definition of sustainability based on the two categories of supply/origin and use/destination does not satisfy the spiritual dimension. Using the two narratives as manifestations of spiritual sustainability presents a way of introducing the spiritual sustainability into this structure.

The relationship between the two narratives and this comprehensive definition of sustainability is shown in Table 1. Grand narratives, as interpretations of regional history and culture, provide inhabitants with an opportunity to reconstruct the region's identity in time. These narratives also act as vehicles for preserving the essence of the ancestors' way of life and its harmony with nature. Emphasising this legacy may be a way of adding value to regional products, a strategy which might work to protect the regional economy from global competition on a purely cost basis. Visitors to the region, perceiving its characteristics as adding to its charm, will develop and promote a greater awareness of the region and its products.

Furthermore, within the region, local inter-personal narratives help to strengthen the business community. Local industry may be able to expand into new markets by focusing on regional needs and by supporting local economic activity. This change in direction will create job opportunities for the inhabitants and thus contribute to the socio-political rejuvenation of the region.

	Sustainabilities of supply/origin			Sustainability of use/destination
	Ecological sustainability	**Economic sustainability**	**Social sustainability**	
Grand narratives	Redifining empirical knowledge	Developing added values	Creating regional identity	Fostering the historical relationships
Local Inter-personal narratives	Sustaianble use of natural resources	Communication and cooperation among the industries	Revitalising the regional society	Increasing the understanding of the region
		Creating job opportunities	Creating a sense of community	

Table 1: The extended meanings of the narratives in the comprehensive definition of sustainability

In drawing on the specific definition of sustainability in the context of house design it may be possible to synthesise the art-science dialectic as set out in Chapter 1. Since the dawn of the modern age, society has born witness to the separation between art, as the pursuit of desire by consumers, and science, as the pursuit of profit on the part of the providers by means of continual technological improvement. This separation has been defined as the crisis of architecture.[12] In order to achieve a new synthesis, grounded in the realities of the modern world, science and art must be placed on an equal footing in order for them to develop mutual understanding. The sum of individual attitudes towards time and space will then provide a firm basis for the redefinition of the region in the collective consciousness. For this to happen, inhabitants of the region must be encouraged to redefine their value-systems (e.g. the simple equation of a higher standard of living with technological advancement) in the context of the new regional narratives. Grand narratives will help people to position themselves in relation to history whilst the development of local inter-personal narratives will broaden their social horizons. For people to develop an understanding of the needs of other groups, art and science must both be integrated into the regional narratives. The role of art in architecture would thus not only be to satisfy the users' spiritual need for enhanced quality of life but would also serve to help create a new regional identity. Moreover, science would be put to the service of people's practical requirements in improving their standard of living by re-evaluating and applying traditional technique and empirical knowledge, again contributing towards the socio-economic sustainability of the region. In order for architecture to satisfy both needs, resources and energy must also be used in a sustainable fashion.

8.2.2 An alternative process for creating sustainability

Having considered a sustainable approach to the design of individual houses, this approach will now be widened to encompass the whole structure of supply and demand for housing on a regional level. In Chapter 1, a structural definition of sustainability based on the two categories of supply/origin and use/destination was set out. By integrating this definition into the Geddesian Notation of Life and the various forms of sustainability that have been developed in this thesis, a pragmatic approach to regional sustainability in housing in the region can be set out: this is summarised in Figure 8. In the figure, the two different scales and functions of the Notation of Life are integrated — the micro-context of the Notation of Life as operative in the house design process and the macro-context of the Notation of Life as the accumulation at regional level of a number of micro-processes.

Firstly, the mechanism of supply and demand for housing in its current unsustainable condition is represented as the "Acts" stage of the macro-context. This mechanism is described not only in scientific terms but also from the perspective of the individuals concerned. At the "Facts" stage, at which point individual users take into consideration their personal requirements for maintaining quality of life, the spiritual sustainability of both users and suppliers/builders influences the house design process. This stage consists of the accumulation of a number of the micro-contexts of the Notation of Life. Since all individuals have their own personal spiritual attitude towards the house design process, they do not always express their spiritual needs in such a way as to be easily comprehensible to others. In the following "Dreams" stage, these expressions of spiritual need are interpreted in the context of local inter-personal and grand narratives, at which point they carry different weights for different forms of sustainability as summarised in Table 1, in order for them to be integrated into the macro-context. This narrative knowledge, as acquired in the "Dreams" stage, is then incorporated into the scientific understanding of sustainability; this process of reintegration will reconstruct the supply and demand structure, shown as "Deeds" — finally constituting an alternative structure for regional sustainability. However, achieving this form of sustainability is still not the region's ultimate goal; rather, it reappears as "Acts" in the next process and the sequence recommences as the region progresses ever closer to full sustainability, through a process of iteration.

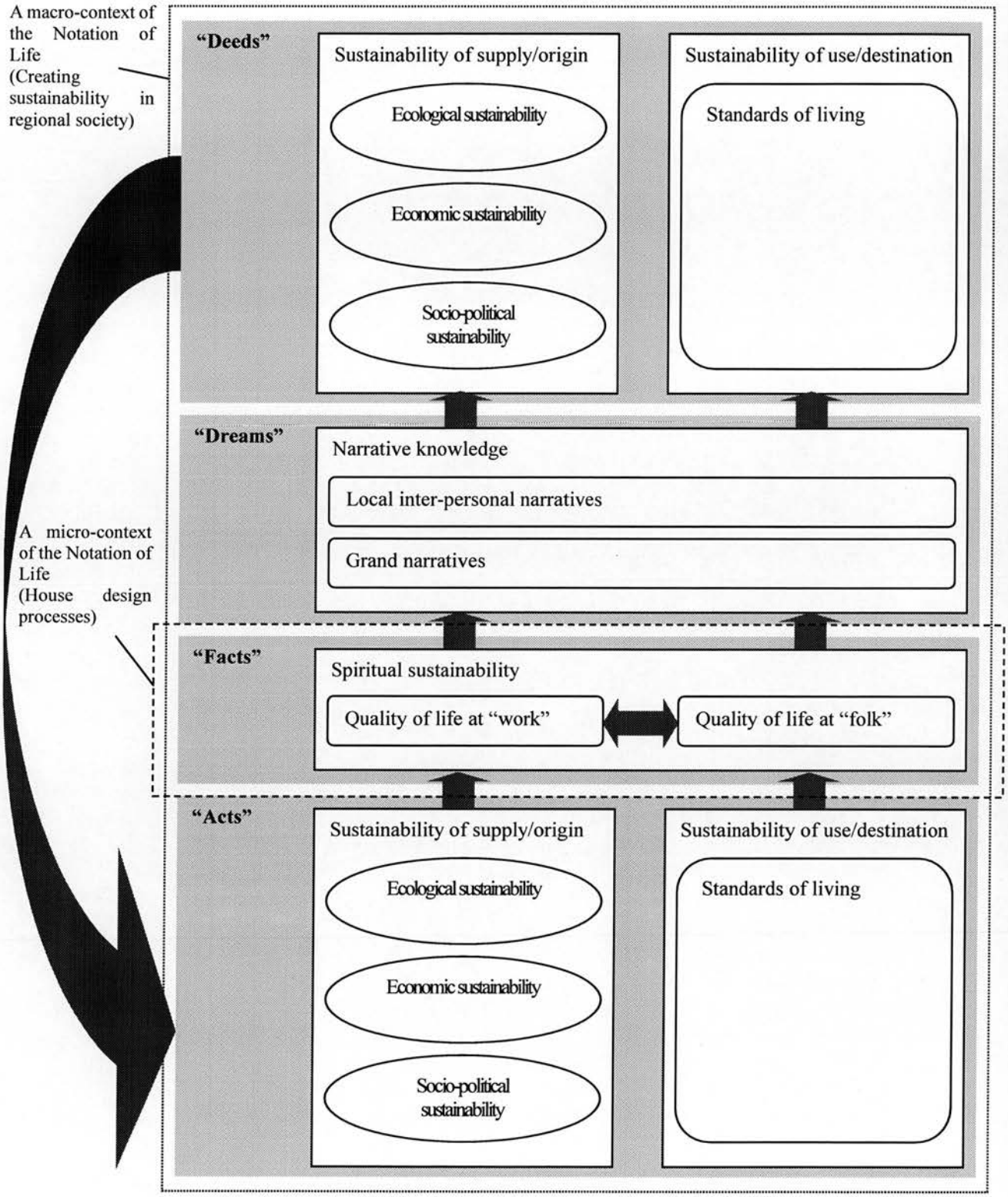


Figure 8: Regional sustainability: a pragmatic structure

(The relationship between micro and macro-contexts of the Notation of Life)

Within this whole process, users, builders and architects all have significant roles to play in the elaboration of the micro-contexts of the Notation of Life. But the direction of the whole region as set out in the macro-context of the Notation of Life is brought about through political decision-making and is implemented in practice by the regional planners. When the public's emotional contribution encounters the contribution of the politicians and scientists then an integrated vision of regional society will arise, in which sustainability may emerge as the ideal balance between the various value-systems and approaches at work.

8.2.3 Sustainability: unsolved issues

Having set out a sustainable approach to regional-based house design this study will conclude by identifying obstacles to the promotion of this approach.

The largest obstacle is the sway still held by media advertising in individual decision-making. In order to set individuals free from the power of falsely generated information and to empower them to develop their own sets of social values, alternative ways of promoting individual narratives are crucial. Aside from the role that architects can play in this respect, activities that are currently being undertaken by the not-for-profit sector could also be beneficial in helping consumers, in co-operation with architects and builders, learn more about house design and thus enhance their capacity for independent decision-making. Moreover, the spread of the internet is providing consumers with more opportunities to access information independently, leading them to take a more active role in the design process. The virtual community arising therefrom is beginning to constitute an alternative public sphere, which supports the emergence of a shared set of values within the community through online discussion of the issues. This study seeks to promote the house design process as a series of real concrete interactions independent of the media. This does not mean however that virtual reality is also a target for criticism; indeed, the internet is increasingly important in creating an alternative community amongst people who share common values, which in turn reinforces the real interactions discussed above.

The power of the Internet also provides a springboard for Japanese house design to transcend the regional context. Currently, despite the fact that the region is composed of the sum of individual perceptions of it, definitions of the region still rely on more strictly geographical factors such as traditional views of the landscape and the structures of community-based commercial exchange. Yet now that the Internet has begun to impact on consumer behaviour, the way in which a region is defined

is becoming more ambiguous. It is no longer restricted to a geographic region; instead, it arises out of a community based on people living in different areas but confronted by common problems and seeking common solutions for them.

The second obstacle is the fact that environmental sustainability is not often recognised as a priority in Japanese society. In western countries, not-for-profit and non-governmental organisations influence governmental decision-making in addition to voters and businesses, allowing the environmental view to be put across. In Japan however, the not-for-profit sector does not play the same role in lobbying and such organisations do not therefore have the power to influence decision-making. This situation means that many people do not have a clear understanding of the way in which individual behaviour contributes to the degradation of the global environment. This study has set out an anthropocentric approach and consequently, environmental issues have been considered in this light. It is essential for individual members of the public to acquire knowledge of current environmental issues that correspond and that can be adapted to their own feelings and experience. For this to happen, the continued dissemination of information within the community is crucial.

The third obstacle to sustainability is the current state of architectural training. In Japan, the training received at university tends to concentrate on the technological side of design and thus tends to underplay sociological and historical factors. Modern architectural training was introduced in the Meiji period at the end of the nineteenth century when a great deal of imported construction technology began to be applied to Japanese building. This approach is at the root of the current tendency and may help to explain why architects base their designs so heavily on technological developments. Moreover, their ignorance of socio-economic and political concerns allows students to adopt an egotistical attitude towards design. The arts and the sciences are kept so separate in the existing curriculum that architectural students have a very inferior sense of social responsibility, as the current situation demonstrates. As architects are increasingly called upon to produce buildings which marry art and science so the focus of their training should shift away from an understanding of the design process based exclusively on the application of new technology or the expression of a particular aesthetic towards an alternative design process which operates in partnership with other scholars such as historians, anthropologists and sociologists in order to identify and satisfy the needs of both the users and the region. The ability to work in this way will be crucial for professionals in the future.

1 See: Chapter 4 and 5.
2 See: Introduction.
3 See: Chapter 6.
4 See: Chapter 7.
5 See: the Notation of Life in Chapter 2.
6 See: Chapter 1.
7 Anthony P. Cohen, The Symbolic Construction of Community (London: Routledge, 1985), p. 99.
8 Anthony P. Cohen, The Symbolic Construction of Community, p. 102.
9 See: Chapter 6.
10 See: Chapter 7.
11 See: Chapter 6 and 7.
12 See: Chapter 1.

Glossary

Ainu	ethnic group originally living in Hokkaido
akirame	resignation
bitai	eroticism
Dosanko	Hokkaido citizen
Edo	the name of "Tokyo" during the Edo period (1600-1868)
Edokko	Edo citizen
Ezo	the name of "Hokkaido" before the Meiji Restoration (1868)
hari	strength of character
hibachi	brazier using charcoal
iki	refinement, one of the main characteristics that Edokko has
ikiji	spirit
HOPE Project	project for developing the local culture and economy through council house design and the planning areas, promoted by the Ministry of Construction
kamui	gods of the Ainu
samurai	warriors
satoyama	mountain near the village, shared by the members of the community for various purposes
shise	the Ainu's housing made from wood, grasses and bamboo

Bibliography

English Literatures

Abbott, John, Sharing the City: Community Participation in Urban Management (London: Earthscan, 1996)

Adorno, Theodor W. and Horkheimer, Max, Dialectic of Enlightenment, trans. by John Cumming (London: Verso, 1979)

Bachelard, Gaston, The Poetics of Space: the Classic Look at We experience Intimate Places (Boston: Beacon Press, 1994)

Bartelmus, Peter, Environment, Growth and Development: The Concepts and Strategies of Sustainability (London: Routledge, 1994)

Baudrillard, Jean, The Consumer Society: Myth and Structure (London: Sage Publications, 1998)

Bill, Max (ed.), Le Corbusier & P. Jeanneret: Æuvre complète, 1934-1938 (Zurich: Les Editions d'Architecture, 1964)

Boardman, Philip, The Worlds of Patrick Geddes: Biologist, Town Planner, Re-educator, Peace-warrior (London: Routledge & Kegan Paul, 1978)

Chenery, Jim, "Postmodern environmental ethics: ethics as bioregional narrative", in Environmental Ethics (Vol. 11, Summer, 1989)

Coaldrake, William H., Architecture and Authority in Japan (London: Routledge, 1996)

Cohen, Anthony P., The Symbolic Construction of Community (London: Routledge, 1985)

Curtis, William J. R., Le Corbusier: Ideas and Forms (Oxford: Phaidon, 1986)

Defries, Amelia, The Interpreter Geddes: the Man and his Gospel (London: George Routledge &Sons, 1927)

Devall, Bill, and Sessions, George, Deep Ecology (Salt Lake City: Peregrine Smith Books, 1985)

Doxiadis, Constantinos A., Between Dystopia and Utopia (London: Faber and Faber, 1966)

Doyal, Len and Gough, Ian. A Theory of Human Need (London: Macmillan, 1991)

—, "Human Needs and Social Change", in Key Concepts in Critical Theory: Ecology, ed. Carolyin Merchant (New Jersey: Humanities Press, 1994)

Ellin, Nan, Postmodern Urbanism (Cambridge, MA: Blackwell, 1996)

Engel, Heinrich, The Japanese House; A Tradition for Contemporary Architecture (London: Charles E. Tuttle, 1964)

Fagence, Michael, Citizen Participation in Planning (Oxford: Pergamon Press, 1977)

Finnegan, Ruth, "Storying the Self: Personal Narratives and Identity", in Consumption and Everyday Life, ed. Hugh Mackay (London: Sage Publications, 1997)

Fishman, Robert, Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Crobusier (New York: Basic Books, 1977)

Foucault, Michel, Power/Knowledge, Selected Interviews and Other Writings 1972-1977, trans. by Colin Gordon, Leo Marshall, John Mepham and Kate Soper (New York: Harvester Wheatsheaf, 1980)

Frampton, Kenneth, "Prospects for a Critical Regionalism", in Theorising a New Agenda for Architecture: an Anthology of Architectural Theory 1965-1995, ed. Kate Nesbitt (New York: Princeton Architectural Press, 1996)

—, "The Rise and Fall of Mega-Architecture: Arata Isozaki and the Crisis of Metabolism 1952-66", in GA Architect 6: Arata Isozaki, vol. 1 1959-1978 (Tokyo: A. D. A. Edita, 1991)

—, "The Work of Tadao Ando", in GA: Tadao Ando (Tokyo: A.D.A. Edita, 1987)

Freud, Sigmund, "Uncanny", in Collected Papers, Vol. IV, Sigmund Freud, trans. by Joan Riviere (London: Leonard & Virginia Woolf, 1925)

Friends of the Earth, Towards a Sustainable Scotland: a Discussion Paper (1996)

Gare, Arran E., Postmodernism and the Environmental Crisis (London: Routledge, 1995)

Geddes, Patrick, "Civics: As Concrete and Applied Sociology, Part II", in The Ideal City, ed. Helen Meller (Leichester University Press, 1979)

—, Cities in Evolution (London: Ernest Benn Limited, 1968)

—, Dramatisations of History: The Masque of Ancient Learning and Its Many Meanings (Edinburgh: Patrick Geddes and Colleagues, 1923)

Geddes, Patrick and Thomson, Arthur J., Life: Outline of General biology (London: Williams & Norgate, 1931)

Gilbert, Richard, Steveson, Don, Girardet, Herbert and Stren, Richard, Making Cities Work: The Role of Local Authorities in the Urban Environment (London: Earthscan, 1996)

Glikson, Arthur, Regional Planning and Development: Six Lectures Delivered at the Institute of Social Studies, at the Hague, 1953 (The Hague: Leiden, 1955)

Gross, Stanley J., "The Process of Change: Variations on a Theme by Virginia Satir", in Journal of Humanistic Psychology (Vol. 34, No. 3, 1994)

Guattari, Fèlix, Les Trois Ecologies, trans. Masa'aki Sugimura (Tokyo: Ohmura Shoten, 1993)

Habermas, Jürgen, Toward a Rational Society: Students Protest, Science, and Politics (Cambridge: Polity Press, 1969)

—, "Modernity — An Incomplete Project", in New German Critique, 22 (Winter, 1981)

—, Knowledge and Human Interests, trans. by Jeremy Shapiro (London: Heinemann, 1972)

—, "Modernity — An Incomplete Project", in New German Critique, 22.

—, The Theory of Communicative Action, Volume 1: Reason and the Rationaliation of Society, trans. Thomas McCarthy (Cambridge: Polity Press, 1987)

Hague, Cliff, The Development of Planning Thought: A critical perspective (London: Hutchinson, 1984)

Hanley, Susan B., Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture (Berkeley, LA: University of California Press, 1997)

Harvey, David, The Condition of Postmodernity: An Enquiry into the Origin of Cultural Change (Cambridge, MA: Blackwell, 1990)

Heidegger, Martin, "... Poetically Man Dwells...", in Rethinking Architecture, ed. Neil Leach (London: Routledge, 1997)

—, "Building, Dwelling, Thinking", in Rethinking Architecture: A reader in cultural theory, ed. Leach, Neil (London: Routledge, 1997)

—, The Question Concerning Technology and Other Essays, trans. by William Lovitt (New York: Harper & Row, 1977)

Hiberseimer, L., The Nature of Cities (London: Paul Theobald, 1955)

Horowitz, Irving Louis, Radicalism and the Revolt against Reason: the Social Theories of Georges Sorel (London: Routledge, 1961)

Hough, Michael, Out of Place: Restoring Identity to the Regional Landscape (London: Yale University Press, 1990)

Jameson, Fredric, "The Cultural Logic of Late Capitalism", in Rethinking Architecture: A Reader in Cultural Theory, ed. Neil Leach (London: Routledge, 1997).

Jencks, Charles A., The Language of Post-modern Architecture: Fifth Revised Enlarged Edition (London: Academy Editions, 1987)

—, Le Corbusier and the Tragic View of Architecture (London: Allen Lane, 1973)

—, The Language of Post-modern Architecture: Fourth Revised Enlarged Edition (London: Academy Editions, 1984)

Jenkins, Richard, Social Identity (London: Routledge, 1996)

Kosaka, Kenji (ed.), Social Stratification in Contemporary Japan (London: Kegan Paul International, 1994)

Koschmann, J. Victor, Revaluation and Subjectivity in Postwar Japan (Chicago: The University of Chicago Press, 1996)

Kruft, Hanno-Walter, A History on Architectural Theory: From Vitruvius to the Present, trans. Ronald Taylor, Elsie Callander and Antony Wood (New York: Zwemmer, 1994)

Le Corbusier, The Radiant City, trans. Pamela Knight, Eleanor Levieux and Derek Coltman (London: Farber and Farber Limited, 1967)

—, Destin de Paris (Paris: Fenand Sorlot, 1941)

Le Crobusier and François De Pierrefeu, The Home of Man, trans. Clieve Entwistle and Gordon Holt (London: The Architectural Press, 1948)

Lethaby, William Richard, Architecture, Nature and Magic (London: Gerald Duckworth, 1956)

—, Architecture: An Introduction to the History and Theory of the Art of Building (London: Oxford University Press, 1955)

Lozano, Eduardo E., Community Design and the Culture of Cities: The Crossroad and the Wall (Cambridge: Cambridge University Press, 1990)

Lutz, Mark, "Living Economics in Perspective", in Real-life Economics, ed. Paul Ekins (London: Routledge, 1992)

Lyotard, Jean-François, The Postmodern Condition: A Report on Knowledge, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984)

Matsubayashi, Kazuo, "Spirit of Place: The Modern Relevance of an Ancient Concept", in The Power of Place and Human Environment, ed. by James A. Swan (Bath: Gateway Books, 1993)

Max-Neef, Manfred A., Human Scale Development: Conception, Application and Further Reflections (New York: The Apex Press, 1991)

McClain, James L. and Merriman, John M., "Edo and Paris: Cities and Power", in Edo and Paris: Urban Life and the State in the Early Modern Era, eds. James L. McClain, John M. Merriman and Ugawa Kaoru (Ithaca, NY: Cornell University Press, 1994)

McLennan, Gregor, "The Enlightenment Project Revisited", in Modernity and Its Future, eds. Stuart Hall, David Held and Tony McGrew (Cambridge: Open University, 1992)

Moeran, Brian and Skov, Lise, "Japanese Advertising Nature: Ecology, Fashion, Women and Art", in Asian Perceptions of Nature: a Critical Approach, eds. Ole Bruun and Arne Kalland (Surry: Curzon Press, 1995)

Moon, Okpyo, "Making Nature in Rural Japan", in Japanese Images of Nature: Cultural Perspectives, eds. Pamela J. Asquith and Arne Kalland (Surrey: Curzon Press, 1997)

Naess, Arne, Ecology, Community and Lifestyle: Outline of an Ecosophy, trans. David Rothenberg

(Cambridge: Cambridge University Press, 1989)

Nakamura, Takafusa, The Postwar Japanese Economy: Its Development and Structure, 1937-1994 (Tokyo: University of Tokyo Press, 1995)

Nishiyama, Matsunosuke, Edo Culture: Daily Life and Diversions in Urban Japan, 1600-1868, trans. by Gerald Groemer (Honolulu: University of Hawai'i Press, 1997)

Norberg-schulz, Christian, Intentions in Architecture, (Cambridge, MA: The MIT Press, 1968)

—, Genius Loci: Towards a Phenomenology of Architecture (New York: Rizzoli, 1979)

Papanek, Victor, The Green Imperative: Ecology and Ethics in Design and Architecture (London: Thames and Hudson, 1995)

Pons, Pilippe, D'Edo à Tokyo, trans. in Japanese by Mikio Kamiya (Tokyo: Chikuma, 1992)

Raffel, Stanley, Habermas, Lyotard and the Concept of Justice (London: Macmillan Press, 1992)

Rosenberger, Nancy R., "Tree in summer, tree in winter: movement of self in Japan", in Japanese sense of self, ed. Nancy R. Rosenberger (Cambridge: Cambridge University Press, 1992),

Ross, Michael Franklin, Beyond Metabolism: The New Japanese Architecture (New York: McGraw-Hill Book Company, 1978)

Rowe, Colin and Slutzky, Robert, Transparency (Basel, Switzland: Birkhäuser Verlag, 1997)

Russell, Peter, "The Psychological Roots of the Environmental Crisis", in, Environment and Health: a Holistic Approach, ed. Robert Krieps (Hants, Gower, 1989)

Sale, Kirkpatrick, Dwellers in the Land: The Bioregional Vision (San Francisco: Sierra Club Books, 1985)

Saleman Paul, Local Sustainability: Managing and Planning Ecologically Sound Places (London: Paul Chapman, 1996)

Sato, Fumiaki, "A Comparative Study of Regional Sustainability", in Journal of Architectural Planning, Environment and Engineering

Satir, Virginia, The Satir Model: Family Therapy and Beyond (Palo Alto, CA: Science and Behavior Books, 1991)

Semper, Gottfried, The Four Elements of Architecture and Other Writings, trans. Harry Francis Mallgrave and Wolfgang Herrmann (Cambridge: Cambridge University Press, 1989)

Tange, Kenzo, "A Plan for Tokyo 1960", in Kenzo Tange 1946-1969: Architecture and Urban Design, ed. Udo Kultermann (London: Pall Mall Press, 1970)

—, "Recollections: Architect Kenzo Tange", in The Japan Architect (No. 341, September 1985)

Tanizaki, Jun'ichro, In Praise of Shadows, trans. by Thomas J. Harper and Edward G. Seidensticker (Tokyo: Charles E. Tuttle, 1977)

Tuan, Yi-Fu, Topophilia: A Study of Environmental Perception, Attitudes, and Values (New York: Columbia University Press, 1974)

Tzonis, Alexander and Lefaivre, Liane, "Why Critical Regionalism Today?", in Theorising a New Agenda for Architecture: an Anthology of Architectural Theory 1965-1995, ed. Kate Nesbitt (New York: Princeton Architectural Press, 1996)

Vestal, James E., Planning for Change: Industrial Policy and Japanese Economic Development, 1945-1990 (Oxford: Clarendon Press, 1993)

Vidler, Anthony, The Architectural Uncally; Essays in the Modern Unhomely (Cambridge, Massachusetts: The MIT Press, 1992)

Vitruvius, The Ten Books on Architecture, trans. Morris Hicky Morgan (New York: Dover Publications, 1960)

Watanabe, Hitoshi, The Ainu Ecosystem: Environment and Group Structure (Tokyo: University of

Tokyo Press, 1972)

Welter Volker M., Arthur Glikson, "Thinking Machines", and the Planning of Israel (The City after Patrick Geddes: International Symposium, 8-10 May, 1998)

White, Stephen K., The Recent Work of Jürgen Habermas: Reason, Justice and Modernity (Cambridge: Cambridge University Press, 1988)

Wilson, Barrie, "The Aesthetics of the Good Life", in Edinburgh Architecture Research, Vol. 20 (1993)

Wilson, Colin St John, The Other Tradition of Modern Architecture: The Uncompleted Project (London: Academy Editions, 1995)

Yatsuka, Hajime, "Architecture in the Urban Desert: A Critical Introduction to Japanese Architecture after Metabolism", in Oppositions 23 (Winter, 1981)

Yeang, Ken, Designing with Nature: The Ecological Basis for Architectural Design (New York: McGraw-Hill, 1995)

Yoshida, Kenko, Essays in Idlness: the Tsurezuregusa of Kenko, trans. by Donald Keene (Tokyo: Charles Tuttle, 1981)

Japanese Litratures

Adachi, Fujio, Kita no Sumai to Machinami: Mohitotu no Sekatsu Kukan [Housing and Townscape of the North: A Different Kind of Living Environment] (Hokkaido: Hokkaido Daigaku Tosyo Kankokai, 1990).

足達　富士夫：『北の住まいと町並：もうひとつの生活空間』，北海道大学図書刊行会，1990年

Ando, Yoshitomo, Mokuzai Shijoron: Sengo Nippon ni okeru Mokuzai Mondai no Tenkai [Wood Market: The Evolution of Wood Issues in Postwar Japan] (Tokyo: Nippon ringyo chosa-kai, 1992).

安藤　嘉友：『木材市場論：戦後日本における木材問題の展開』，日本林業調査会，1992年

The Architectural Institute of Japan, Lifecycle CO_2 de Tatemono wo Hakaru: Tatatemo no Kankyo Fuka Hyoka no Tebiki [Measuring Building by Lifecycle CO_2] (1997).

日本建築学会：『ライフサイクル CO_2 で建物を測る：建物の環境負荷評価の手引き』，1997年

—, Chikyu Chiiki Kankyo Chikyu Kankyo no Arikata [A Prescription for the Earth, Local Environments, and the Global Environment] (1995).

—：『地球、地域環境、地球環境の在り方』，1995年

—, Kenchiku ga Chikyu Kankyo ni Ataeru Eikyo [Architectural Influence on the Global Environment], (1992).

—：『建築が地球環境に与える影響』，1992年

Asakawa, Shigeo, "Mofutatsu no 'Nippon Kukan': Minamishima to Hokkaido Ainu jukyo Saiko", in Kenchiku Zasshi [The Other Two "Japanese Spaces": Reconsidering Dwelling of Minami Islanders and Hokkaido's Ainu] (May 1993).

浅川 滋男：「もうふたつの「日本空間」：南島と北海道アイヌ住居再考」，『建築雑誌』，1993年5月号

Berque, Augustin, Fudo toshiteno Chikyu [Médiance] (Tokyo: Chikuma Syobo, 1994).

オギュスタン　ベルク：『風土としての地球』、築摩書房，1994年

Brown, Lester R., Chikyu Hakusyo 1998-99 [State of the World] (Tokyo: Diamond Sya, 1998).

レスター　R.　ブラウン：『地球白書 1998-99』，ダイヤモンド社，1998年

The Economic Planning Agency, Keizai Hakusyo [Economic White Paper] (1956).

経済企画庁：『経済白書』，1956 年

—, Kokumin Seikatsu Hakusyo [Annual White Paper on Life in Japan] (1995).

—：『国民生活白書』，平成 7 年版

Eco-Polis Cenre, Itabashi Ecopo [Eco-Polis Centre news] (October and November 1996).

エコポリスセンター：『いたばしエコポ』，（No. 11，1996 年 10、11 月）

The Forestry Agency, Ringyo Hakusyo [Forestry White Paper] (2000).

林野庁：『林業白書』，平成 12 年度

Funo, Syuji, Sengo Kenchiku no Syuen: Seikimatsu Kenchikuron Note [The End of Postwar Architecture] (Tokyo: Renga Syobo Shinsya, 1995).

布野　修司：『戦後建築の終焉：世紀末建築論ノート』，れんが書房新社，1995 年

Haga, Noboru, Dai Tokyo no Shiso [Thoughts of Greater Tokyo] (Tokyo: Yuzankaku, 1992).

芳賀　登：『大東京の思想』，雄山閣，1992 年

Hagino, Toshio, Tokyo Mokuzai Shijo no Shiteki Kenkyu [A Historical Study of the Tokyo Wood Market] (Tokyo: Nippon Ringyo Chosakai, 1981).

萩野　敏雄：『東京木材市場の史的研究』，日本林業調査会，1981 年

Hanyu, Takuji, Ringyo ni Tazusawaru Hitori toshite " Tokyo no Ki de Ie wo Tsukuru Kai" ni Kitaisurukoto [What I Expect of the "Group for Creating Housing of Tokyo Wood " as One of The Forestry Industries] (1998).

羽生　卓史：『林業に携わる一人として「東京の木で家を造る会」に期待すること』，1998 年

Hokkaido, Hokaido Ringyo Tokei [Hokkaido Forestry Statistics] (1995).

北海道：『北海道林業統計』，平成 7 年度，1996 年

—, Domin Sekatsu Hakusyo: Domin Sekatsu no Sengo 50 Nen [Annual White Paper on Life in Hokkaido] (1995).

—：『道民生活白書：道民生活の戦後 50 年』，平成 7 年度版，1996 年

—, Hokkaido Chikyu Ondanka Boshi Keikaku [Plan for Preventing Global Warming] (2000).

—：『北海道地球温暖化防止計画』，2000 年 6 月

—, Hokkaido Chikyu Kankyo Hozen Kodo Shishin: Agenda 21 Hokkaido (1996).

—：『北海道地球環境保全行動指針：アジェンダ 21 北海道』，1996 年

—, 21 Seiki wo Ninau Hokkaido no Shinrin Sakutei Project [A Forest Project in Hokkaido For The Twenty First Century].

—：『21 世紀を担う北海道の森林策定プロジェクト』

—, Hokkaido no Rinsangyo [The Forestry Industry in Hokkaido] (1995).

—：『北海道の林産業』，平成 6 年度版，1995 年

—, Hokkaido Ringyo no Doko [Hokkaido Forestry Trends] (Hokkiado: Hokkaido Ringyo Fukyu Kyokai, 1996).

—：『北海道林業の動向』，平成 7 年度，北海道林業普及協会，1996 年

—, 21 Seiki wo Ninau Hokkaido no Shinrin [Forests in Hokkaido Towards the Twenty-First Century] (1996).

—：『21 世紀を担う北海道の森林（試案）』，1996 年

Hokkaidoritsu Kanchi Jutaku Toshi Kenkyujo, Kenkyu Hokoku No. 69: Sho Energy 100 Nen Jutaku ni Kansuru Kenkyu [Research Report No. 69: Study of Energy-Conserving 100-Year Houses in Cold Regions] (1997).

北海道立寒地住宅都市研究所：『研究報告　No. 69：省エネルギー100 年住宅に関する研究』，1997 年

HOPE Keikaku Suishin Kyogikai, 96 HOPE Keikaku [96 HOPE Project] (1996).

HOPE 計画推進協議会：『96HOPE 計画』，1996 年

Ito, Masashi, Udagawa, Mitsuru and Mikami, Takehiko, "Tokyo Tonai no Kion Bunpu ni Tsuite (Sono 1)" [A Survey on the Distribution of Temperature in Tokyo (Vol. 1)], in Tokyo To Kankyo Kagaku Kenkyujo Nenpo (1994).

伊藤　政志，宇田川　満，三上　岳彦：「東京都内の気温分布について（その１）」，『東京都環境科学研究所年報』，1994 年

Jutaku Tokei Centre, Dai 8 Kai Hokkaido Jutaku Nenkan [Hokkaido Housing Statistics] (1996).

住宅統計センター：『第８回北海道住宅年鑑』平成８年度版，1996 年

Kankyo Sekkei, "Rin Shinrin Gata Sangyo Toshi" Keisei Chosa Hokokusyo: Mori to Kyoseisuru Seikatsu Bunka Ken to Sangyo no Sosyutsu [A Planning Report for "Forest Side-Type-Cities"] (1992).

環境設計下村矢尾板都市建築研究所：『「臨森林型産業都市」形成調査報告書：森と共生する生活文化圏と産業の創出』，1992 年

Kishine, Takuro, Mori to Bunmei [Forest and Civilisation] (Tokyo: Sun mark Syuppan, 1996).

岸根　卓郎：『森と文明』，サンマーク出版，1996 年

Kitahara, Toshio, Edo no Kankyo Kanri System [Edo Environmental Management Systems] (Material from the Architectural Institute of Japan).

北原　理雄：「江戸の環境管理システム」，日本建築学会資料

Kobayashi, Hidetsugu, "Sustainable na Jukankyo wo Mokuhyotosuru Keikaku no Wakugumi" [Planning Framework towards a Sustainable Living Environment] in Syo Toshi no Redesign System ni Kansuru Keikakuteki Kenkyu (Heisei 8 Nendo Kagaku Kenkyuhi Hojokin Kenkyuseika Hokokusyo, 1997).

小林英嗣：「サスティナブルな住環境を目標とする計画の枠組み」，『小都市のリデザイン・システムに関する計画的研究』，平成８年度科学研究費補助金研究成果報告書

Kodama, Yuichiro, "Tokusyu 'Mokuzo Jutaku to Kankyo Kyosei" [Wooden Housing and Environmental Symbiosis], in Jutaku to Mokuzai (April 1996).

小玉 祐一郎：特集「木造住宅と環境共生」，『住宅と木材』，1996 年 4 月

Kuki, Syuzo, "Iki" no Kozo [The Structure of 'Iki'] (Tokyo: Iwanami Bunko, 1997).

九鬼　周造：『「いき」の構造　ほか二篇』，岩波文庫，1997 年，初版『思想』第 92 号，第 93 号，1930 年 1 月，2 月

Mihashi, Norihiro, Mori to CO_2 no Keizaigaku: Chikyu Ondanka Taisaku eno Shinteigen [Economics of Forests and CO_2] (Tokyo: PHP Kenkyujo, 1997).

三橋規宏：『森と CO_2 の経済学：地球温暖化対策への新提言』，PHP 研究所，1997 年

Minami, Yuzo, "Kokimitsu Kodannetsu Jutaku no Jissen Koza", in Kenchiku Gijutsu [A Practical Guide for High Insulation and Airtight Housing] (July 1996).

南　雄三：「高気密高断熱住宅の実践講座」，『建築技術』，1996 年 7 月号

—, Toshin no Kyosei Jutaku: Minami Yuzo Taku Saisei Koji [A Co-Existent House in Downtown Tokyo: The Renaissance of Minami House] (1996).

—：『都心の共生住宅：南雄三宅再生工事』，1996 年

Mimura, Hiroshi, Chiiki Kyosei no Toshi Keikaku [City Planning for Regional Symbiosis] (Tokyo: Gakugei Suppansya, 1997).

三村浩史：『地域共生の都市計画』，学芸出版社，1997 年

The Ministry of the Environment, Kankyo Hakusyo [Quality of the Environment in Japan] (2000).

環境庁：『環境白書』，2000 年

—, Donaru Chikyu Dosuru 21 Seiki [The Future of the Earth, the Future of the Twenty-first Century] (1996).

—：『どうなる地球・どうする 21 世紀』，1996 年

The Ministry of Construction, Kensetsu Hakusyo [Construction White Paper] (1996, 2000)

建設省：『建設白書』，1996 年，2000 年

Miyano, Isse, Shisyu Tsubetsu [Tsubetsu Anthology] (Tokyo: France Do, 1995).

宮野一世：『詩集　津別』，ふらんす堂，1995 年

Murashima, Yoshinao (ed.), America Ringyo to Kankyo Mondai [Forestry in the United States and the Environmental Issues] (Tokyo: Nippon Keizai Hyoronsya, 1998).

村嶌由直（編）：『アメリカ林業と環境問題』，日本経済評論社，1998 年.

Nippon Jutaku Kyokai, Chiiki Jutaku Hikkei [Regional Dwelling Handbook] (1995).

日本住宅協会：『地域住宅必携』，平成 7 年度版

Nishiyama, Matsunosuke, Edokko (Tokyo: Yoshikawa Kobunkan, 1980).

西山　松之助：『江戸っ子』，吉川弘文館，1980 年

Norin Tokei Kyokai, Shinrin Hakusyo [Forestry White Paper] (1995).

農林統計協会：『林業白書』平成 7 年度版

OECD, Boeki to Kankyo: Boeki ga Kankyo ni Ataeru Eikyo [Environmental impacts of Trades] (Tokyo: Cyuo-hoki syuppan, 1995).

ＯＥＣＤ：『貿易と環境：貿易が環境に与える影響』，1995年，中央法規出版

The Prime Minister's Office, Gekkan Seron Cyosa "Kankyo Hozen to Kurashi" [Public Opinion Poll: Environmental Conservation and Daily Life] (September 1995).

総理府広報室：『月刊　世論調査「環境保全とくらし」』，1995 年 9 月.

—, Gekkan Seron Cyosa "Shinrin Ringyo" [Public Opinion Poll: Forests and Forestry] (September 1996).

—：『月刊　世論調査「森林、林業」』，1996 年 9 月

—, Gekkan Seron Cyosa "Seikatsu Kankyo Seikatsu Gata Kogai" [Public Opinion Poll: Living Environment] (October 1996).

—：『月刊　世論調査：生活環境，生活型公害』，1996 年 10 月

Sakai, Kanji, Kenchiku Katsudo to Chikyu Kankyo: Kenchiku no Lifecycle Kankyo Fuka [Architectural Activities and the Global Environment: Life Cycle Environmental Burden of Buildings] (Tokyo: Kuki-Chowa Eisei-Kogakkai-Shinsyo, 1995).

酒井寛二：『建築活動と地球環境：建築のライフサイクル環境負荷』，空気調和、衛生工学会新書，1995 年

Sakakibara, Eisuke, Shinpo Syugi karano Ketsubetsu: Nippon Ishituron no Tsumi [Farewell to Progressivism] (Tokyo: Yomiuri Shinbunsya, 1996).

榊原英資：『進歩主義から決別：日本異質論の罪』，読売新聞社，1996 年

Sajima, Tomomi, Kansei to Ninshiki wo Sodateru Kankyo Kyoiku [Environmental Education for Fostering Sensibility and Consciousness] (Tokyo: Kyoiku Syuppan, 1996).

佐島群巳：『感性と認識を育てる環境教育』，教育出版，1996 年

Sapporo Shi, Sapporo Tokeisho [Statistics of Sapporo] (1996).

札幌市：『札幌統計書』平成８年度版

The Science and Technology Agency Shigen Cyosakai, Toshi ni okeru Energy Riyo ni Kansuru Cyosa Hokoku: Johoka no Shinten no Nakade [Research on Energy Use in Urban Areas] (1996).

科学技術庁資源調査会：『都市におけるエネルギー利用に関する調査報告：情報化の進展の中で』，1996 年

Shin Mokuzo Jutaku Gijutsu Kenkyu Kyogikai, Shin Zairai Koho Manual [New Standard Japanese Construction Method Manual] (1995).

新木造住宅技術研究協議会：『新在来構法マニュアル』，1995 年

Sugawara, Satoshi, Toi Hayashi Chikai Mori: Shinrin Kan no Hensen to Bunmei [How Close Are People to Forests? Civilisation and Changes in the Perceptions of Forests] (Tokyo: Aichi Syuppan, 1995).

菅原　聡：『遠い林、近い森：森林観の変遷と文明』，愛智出版，1995 年

Suzuki, Kozo, Edo no Keizai Seisaku to Gendai [Economic Policies of Edo and the Present] (Tokyo: Business Kyoiku Syuppansya, 1993).

鈴木　浩三：『江戸の経済政策と現代』，ビジネス教育出版社，1993 年

Tawara, Kozo, Hokkaido no Shizen Hogo: Sono Rekishi to Shiso [Nature Conservation in Hokkaido: History and Philosophy] (Hokkaido: Hokkaido Daigaku Tosho Kankokai, 1990).

俵　浩三：『北海道の自然保護：その歴史と思想』，北海道大学図書刊行会，1990 年

Tokyo To, Tokyo Jutaku Hakusyo [Tokyo Dwelling White Paper] (1998, 2000).

東京都：『東京都住宅白書』，1998，2000 年

—, Tokyo To Kankyo Kihon Kekaku [Tokyo Environmental Basic Plan] (1997).

—：『東京都環境基本計画』，1997 年

—,Tokubetu Ku no Tokei [Statistics of the 23 Ku] (1995).

—：『第 15 回特別区の統計』1995 年

—, Cyuko Jutaku oyobi Reform ni Kansuru Ishiki Chosa [A Survey On Attitudes to Second Hand Dwelling and Its Reform] (1997).

—：『中古住宅及びリフォームに関する意識調査』，1997 年

—, Sekatsu So-on Boshi no Tebiki: Oto ni Yasashiku Kurashi ni Yasuragi wo [Guideline for Preventing Noise from Dwellings] (1990).

—：『生活騒音防止の手引き：音にやさしく，くらしにやすらぎを』，1990 年 3 月

—, Chikyu Kankyo Hozen Tokyo Action Plan [The Global Environment Preservation Action Plan] (1998).

—：『地球環境保全東京アクションプラン』，1998 年

—, Tokyo To Tokei Nenkan [Statistics of Tokyo] (1996).

東京都：『東京都統計年鑑』，1996 年

Toyo Kezai Shinposha, Chiiki Keizai Soran 2001 [Regional Economies 2001] (Tokyo: Toyo Kezai

Shinposya, 2001).

東洋経済新報社：『地域経済総覧 2001 年版』，東洋経済新報社，2000 年

Tsubetsu Cho, Tsubetsu Shinrin Juku Plan [Tsubetsu Forest-Friendly Planning] (1992).

津別町：『つべつ親林塾プラン』，1992 年

—, Tsubetsu Cho Tokeisyo [Tsubetsu Statistics] (1993).

—：『平成 4 年津別町統計書』，1993 年

—, Tsubetsu Shinrin Juku Jutaku Seibi Manual [Tsubetsu Forest-Friendly Planning Housing Design Manual].

—：『つべつ親林塾住宅整備マニュアル』

Tsubetsu Hyakunen Shi Hensan Iinkai, Tsubetsu Cho Hyakunenshi [One Hundred Histories of Tsubetsu].

津別町百年史編纂委員会：『津別町百年史』

Uemura, Takeshi, Mokuzai no Chishiki: Syohin no Ryutsu no Kaisetsu [Knowledge of Wood: Explanation of Products and Their Distribution] (Tokyo: Zaidanhojin keizai Cyosakai, 1996)

上村　武：『木材の知識：商品の流通の解説』，財団法人経済調査会，1996 年

Usami, Chiwako, "Ainu Dento Kaoku 'Shise' ni yoru 'Sumaikata' no Chie" [The Ainu's Wisdom of How to Live in "Shise": the Ainu's Traditional Dwelling], in Bessatsu Takarajima EX Ainu no Hon (1993).

宇佐美智和子：「アイヌ伝統家屋「チセ」による“住まい方“の知恵」，『別冊宝島 EX　アイヌの本』，1993 年

Yamada, Takako, Ainu no Sekaikan: "Kotoba" kara Yomu Shizen to Ucyu [Ainu's View of the World: Nature and Cosmos Read From the Language] (Tokyo: Kodansya Sensyo Mechie, 1994).

山田　孝子：『アイヌの世界観：「ことば」から読む自然と宇宙』，講談社選書メチエ，1994 年

Zaudanhojin Ainu Minzoku Hakubutukan ed, Ainu Bunka no Kisochishiki [A Basic Knowledge of the Ainu 's Culture] (Tokyo: Sofukan, 1993).

財団法人アイヌ民族博物館編：『アイヌ文化の基礎知識』，草風館，1993 年

Zaidanhojin Jutaku Sangyo Joho Service, Jutaku Sangyo Handbook [Housing Industry Handbook] (1997).

財団法人住宅産業情報サービス：『住宅産業ハンドブック』，1997 年度版