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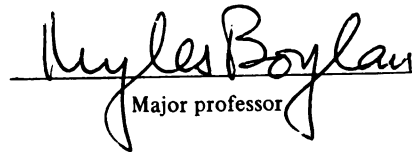
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Possible Socio-Economic Effects of the Development
of the High-Speed Rail Transit Service System in
Underdeveloped Areas in Japan (Case Study: The
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POSSIBLE SOCIO-ECONOMIC EFFECTS OF THE DEVELOPMENT
OF THE HIGH-SPEED RAIL TRANSIT SERVICE SYSTEM
IN UNDERDEVELOPED AREAS IN JAPAN
(CASE STUDY: THE TOHOKU AND HOKKAIDO NEW
TRUNK EXPRESS RAILWAYS AND THE TOHOKU AND
HOKKAIDO DISTRICTS IN JAPAN)

BY

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ABSTRACT

Possible Socio-Economic Effects of the Development of the High-Speed Rail Transit Service System in Underdeveloped Areas in Japan
(Case Study: The Tohoku and Hokkaido New Trunk Express Railways and the Tohoku and Hokkaido Districts in Japan.)

BY

Shunichi Hagiwara

One of the most sophisticated high-speed rail transit systems in the contemporary world, the "New Trunk Express Railway Service System in Japan," made a meteoric rise from obscurity with its swiftness and mass carrying capacity in 1964. Since then, this system has functioned as a typical transit service in the most urbanized area of Japan, which lies along the Pacific coast of the country through 1,000 miles from Tokyo to Fukuoka, the largest city in the southernmost island in Japan, Kyushu. And now, the Japanese government and the Japanese National Railways are building three New Trunk Express Railway systems in the northern part of Japan. The additions by the Japanese National Railways are nothing but a link in the chain of the existing New Trunk Express Railway Service System; however, as a consequence of the phenomenal success of this system since 1964, the Japanese government has decided to utilize this system to resolve the problems of economic, social and cultural regional differences between urban and rural areas, and at the same time, to resolve the problems of overpopulation in urban areas and

depopulation in rural areas which Japan has long been troubled with. However, the impacts of this sort of high-speed rail transit system have always been controversial. Further, these latest planned New Trunk Express Railway Systems are being built in a relatively underdeveloped area in Japan in terms of industrial and commercial development. Consequently, there is some basis for expecting different ramifications from these developments compared to those from the existing system, which is being operated in densely populated areas.

The primary objective of this thesis is to establish what is the probable efficacy of the development of these high-speed rail transit systems in resolving regional differences and in stimulating a new movement of population to resolve the problems of overpopulation and depopulation. Further, if such effects cannot be expected from this system, what kinds of supplemental measures or alternatives do we have to develop?

To examine these questions, interviews were conducted with local government officials, planners, businessmen, and news agents within the area concerned, and planners in the Japanese National Railways. Some econometric analysis concerning the impacts of this system is also introduced as an alternative mode of prognosis.

Statistical and qualitative analysis of information obtained from the various sources yielded some tentative conclusions, principal among which was that the New Trunk Express Railway System cannot be expected, in and of itself, to effect the positive changes hoped for by residents along proposed routes and counted on by visionary government agencies. However, it can be of enormous value in furthering these objects if its development is paralleled by concerted action in other

spheres.

The recommendations derived are: (1) not extending this sort of high-speed and mass rail transit system into the existing metropolitan areas such as Tokyo to prevent the strong "Counter-flow" effect for rural areas; (2) establishing an "urban complex" (a conception that is relatively new) at least 100 kilometers away from the Tokyo area to reduce the strong economic and social influence of Tokyo; (3) building the terminals of the high-speed rail transit within this urban complex; (4) expanding the capacities of national and prefectural universities in rural areas enabling them to increase the number of students to prevent the future exodus of the younger generation from the areas concerned; (5) examining the possibility of the establishment of more inland-type industries to disperse the excessive concentration of industries along the coast of Japan such as the coast of the Pacific Ocean; and (6) reforming agricultural structure in terms of the type and scale of production to attract the younger generation.

Also, recommended are some more drastic measures, such as reform of the tax system in Japan and the fortification of the Anti-Trust Law to prevent the oligopoly of the pivotal administrative functions by major enterprises in the existing metropolitan areas.

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INTRODUCTION

This study is to examine the potential impacts of the New Trunk Express Railway System upon regional social and economic development in relatively underdeveloped areas in Japan, in particular, in the Tohoku and Hokkaido districts, both in the northern part of the Japanese archipelago.

Chapter one presents the nature and basic features of the high-speed rail transit system, the results of the existing New Trunk Express Railway System, and the details of the development of the latest planned New Trunk Express Railway Service System in the northern part of Japan. Chapter two describes the history of the formation of regional society in Japan since the early seventeenth century as a basis for comprehending the contemporary urban and rural problems in Japan, and the impacts of the New Trunk Express Railway System upon those problems. Chapter three examines the potential impacts of the New Trunk Express Railway System from the experimental data in the past decade, and by some regional industry correlated model in econometrics. Chapter four introduces the reaction of local governments, citizens, and planners on the route of the latest planned New Trunk Express Railways. Especially, the so-called "ambivalent" attitude of local governments in relation to the Central Government is introduced. Chapter five summarizes findings, and Chapter six suggests a few recommendations for facilitating desired positive impacts of the New Trunk Express Railway upon such underdeveloped areas as the Tohoku and Hokkaido districts.

A. Background of the Problem: Twelve years have already passed since the completion of the first New Trunk Express Railway (hereinafter

the New Trunk Express Railway will be referred to as the Shinkansen) between Tokyo and Osaka. In 1972, the extension of the Shinkansen into Okayama, 100 miles west of Osaka, was opened. In 1975, the further extension to Fukuoka, 245 miles west of Okayama, was completed. Today, the total length of the Shinkansen has attained 1,069 kilometers; and during the first twelve years of its operation, its patronage exceeded 800 million passengers, which is equivalent to more than six times the national population of 111 million (See Map I-1).

Through the 1960's, the Japanese economy flourished, and it has been broadly said that the Shinkansen has played a significant role in this economic boom. Also, such effects as the retrenchment of time-distance, the augmentation of transportation capacity, and the conservation of labor force and energy have been experimentarily proved. On the other hand, such negative aspects of the Shinkansen as noise, vibration, and the obstruction of television reception and sunlight, and further, the strong counter-flow effects for rural areas due to the Shinkansen have become critical issues which may have a critical bearing on the future development of the Shinkansen. Further, these latest planned Shinkansens are being built in relatively underdeveloped areas in Japan; therefore, the debates concerning the possible impacts of this high-speed rail transit system have been discussed from different viewpoints compared to those from the existing system, which is being operated in densely populated areas.

These conflicting developments have generated controversy regarding the operation of the Shinkansen. In fact, negative opinions against the extension of the Shinkansen into rural areas, caused by apprehension about the possible negative impacts, have grown strident in recent years.

However, the Japanese government has decided to utilize this Shinkansen system with its swiftness and mass carrying power to resolve the problem of economic, social, and cultural regional differences between urban and rural areas, and at the same time, to resolve the problem of overpopulation in urban areas and depopulation in rural areas. Currently, the construction of the Shinkansen in the northern part of Japan is making steady progress every day.

This study seeks to (1) determine if we can expect any important ramifications following from the development of the Shinkansen in resolving regional differences, economic and social, between urban and rural areas, in particular, between the Tokyo area and the Tohoku and Hokkaido areas; (2) determine if the Shinkansen can stimulate a new movement of population to resolve the problems of overpopulation in the Tokyo area and depopulation in the Tohoku and Hokkaido areas; (3) develop some kinds of supplemental measures or alternatives for resolving the above problems if we cannot expect the desired positive ramifications from the present Shinkansen system.

B. Establishment of Hypothesis: Since the turn of the century, proportionately with the continually increasing importance of the railway transport system in terms of its economic, political, and strategical functions, the improvement of the railway network has been a high priority in Japan. In response to diverse national needs, the Japanese National Railway has long endeavored to improve its transport functions. Government has been using the Japanese National Railways as a key device for implementing local administration. However, transportation facilities per se are dynamic; they give rise to new demands, and greatly affect the structure of regional economy. In fact, the existing Shinkansen

has strongly contributed to the present prosperity of the "Tokaido Megalopolis" (See Section 'D' of "Definitions"), and a rapid development of Fukuoka and Hiroshima cities can be understood only through the extension of the Shinkansen into Hakata. Hence, it is not far-fetched to say that Japan's cities have developed with the development and improvement of the rail transit system; certainly the rail transit system has had important positive and negative impacts upon the metamorphosis of the Japanese archipelago.

Using the above premise, the following hypothesis has been developed: The latest planned Shinkansen which are called the "Tohoku" and "Hokkaido" Shinkansens, will catalyze socio-economic development in the Tohoku and Hokkaido districts. Among the more important aspects of this development will be an increase in social overhead capital, a rise in per capita income, leveling up on educational standards, and improvement of the living environment within the two districts concerned. This study intends to determine whether or not, and to what extent the hypothesis is supported by statistical and qualitative analysis of information obtained from the various sources.

C. Methodology: The following investigations were made in obtaining data and background information for the research:

- (1) Field trip to the Tohoku and Hokkaido regions (Summer, 1976);
- (2) Interviews with local governments and the Chambers of Commerce on the routes of the Tohoku and Hokkaido Shinkansens, and with planners of the Japanese National Railways (Summer, 1976);
- (3) Collection of local data published and made by local governments and the Chambers of Commerce on the route and also made by the Japanese National Railways (Summer, 1976);

- (4) Collection of research reports concerning the impacts of high-speed train transport systems in the areas along the existing Tokaido and Sanyo Shinkansens;
- (5) Collection of literature concerning regional developments in Japan;
- (6) Collection of statistical data published by the local and central governments and quasi-governments, and also by private institutions.

More precise explanation concerning the above investigations will help in judging the process of analysis and deduction by which conclusions were reached.

(1) Field Trip - Prefectures and their capital cities covered by the field trip are shown on Map I-3. Those are Fukushima City of Fukushima prefecture; Sendai City, Miyagi prefecture; Morioka City, Iwate prefecture; Aomori City, Aomori prefecture and Sapporo City, Hokkaido prefecture. The primary objective of this field trip was to experience at first hand the real atmosphere of these cities, and to observe the projects related to the development of the Shinkansen, if any. A number of "welcome banners" for the Shinkansen were found everywhere within these cities, and the building of the new station and facilities for the Shinkansen and urban redevelopments in anticipation of the extension of the Shinkansen were in full swing. Positive expectations for the extension of the Shinkansen were easily inferred from these phenomena.

(2) Interviews - Planning departments of the above five prefectures and cities; Chambers of Commerce of the above five cities plus Hanamaki City, a small city in Iwate prefecture which has long extended an

invitation to the Tohoku Shinkansen to set up its station; news agents in both Aomori and Morioka cities; and the Planning Bureau of the Shinkansen in the Japanese National Railways, were selected as the objects of interviews. Interviews were conducted to answer such questions as: (1) What kinds of expectations these cities and prefectures have for the extension of the Shinkansen into their areas? (2) What kinds of concerns do they have? (3) What kinds of plans do they have in relation to the extension of the Shinkansen? For the planners in the Japanese National Railways, interviews were done concerning the details of the development of the Shinkansen system, and objectives and goals evolved by the Japanese National Railways' planners with respect to the social impacts of the Shinkansen. Throughout the interviews with local planners, a strong and often optimistic expectation for the Shinkansen was conspicuously in evidence. Nevertheless, a matter of prime concern common to all prefectures and cities was the "counter-flow" effect of the Shinkansen, particularly, the loss of local capital due to the takeover of area enterprises by dominant economic powers (usually concentrated in great metropolitan areas), and further movement of population toward urban areas, etc. From these interviews, the author strongly felt that these planners have suffered for lack of a definite trump to realize their ideal plans for their future.

(3) Collection of Local Data - Comprehensive Development Plans from the above five prefectures and cities were collected, and at the same time, a number of data and publications concerning large-scale development projects which are being forwarded by the Central Government and local governments were collected. All of the existing Comprehensive Development Plans were made before the oil embargo of 1973, and as a

result, the re-examinations are being done by all prefectures and cities. Several of the drafts obtained from local government officials for revised plans showed a sensible recognition of the constraints caused by the current recession. These data were quite valuable to comprehend the goals and objectives of each prefecture and city.

(4) Collection of Research Reports - The reports of "The Second and Third International Symposium on Regional Development in 1968 and 1969 in Tokyo;" the research report concerning "The Improvement of Railways and Its Relationship with Highways" done by the Japanese Economic Research Center and Professor Amano of Kyoto University at that time; the research report commissioned by the Tohoku Economic Research Center "The Construction Effect of the Tohoku Shinkansen and the Direction of Regional Improvement;" and the research report of Kyushu Economic Investigation Association titled "The Extension of the Shinkansen into the Kyushu Region and Its Effects on the Kyushu Economy," were collected and examined. It is clearly understood that, although these research reports are creditable academic sources, all of them were published before the contemporary severe recession; accordingly, their predictions with respect to economic growth diverge rather widely from the probabilities. Consequently, much of this information concerning the future impacts of the Shinkansen network was only nominally useful. However, some reports, such as those done by the Japanese Economic Research Center and the Kyushu Economic Investigation Association, were quite worth notice.

(5) Collection of Literature - The Challenge to the Over- and Depopulation (Kamitsu Kaso eno Chosen in Japanese) edited by Zenichi Ito, professor of Tokyo Women's University; The Countermeasures for

Regional Development and Environmental Disruptions (Chiiki Kaihatsu, Kogai eno Taiou) edited by Atsushi Sato, professor of Seikei University; The Theory and Practice of Regional Development (Chiiki Kaihatsu no Riron to Jissai) written by Jiro Narita, professor of Local Autonomy College of Japan; Kenneth K. Kurihara's The Growth Potential of the Japanese Economy; Japan - Economic and Social Studies in Development edited by Heide and Udo Ernst Simons; The Call of Cities (Toshino Miryoku) written by Keihachiro Shimizu and Keiji Hattori; and Econometric Analysis of Regional Economy (Chiiki Keizai no Keiryō Bunseki) written by Joji Ezawa et al.

Among the most useful and valuable sources for the study were Ito's The Challenge to the Over- and Depopulation, and Narita's The Theory and Practice of Regional Development. Especially, the former book was quite up-to-date and its influence on the perspective of this paper may be deemed considerable. Also, Shimizu's and Hattori's The Call of Cities, which represents a perspective in counterposition to Ito's and Morita's, was utilized for several unusual insights it contains. Ezawa's Econometric Analysis of Regional Economy was quite useful for understanding the so-called "Amano Model" developed by Professor Amano to analyze the economic impacts of the Shinkansen upon regional society.

(6) Collection of Statistical Data - Primary sources for demographic socio-economic, and other statistical data: White Paper of National Land Utilization (Kokudo Riyo Hakusho) published by National Land Agency of Japan; Prefectural Powers and Potentials (Minryoku) edited by Asahi Shinbun (Asahi Newspaper); the extra editions of People and National Land Policy (Hito to Kokudo) titled Basic Data List for National Land Use Planning--Part I and Part II (Kokudo Keikaku no Kiso Shiryo Shu;

Sono I; Sono II); Municipal Year Book of Japan (Nippon Toshi Nenkan) edited by the National Mayors' League; and the Japanese National Railway-- Its History and Future (Kokutetsu - Sono Kiseki to Shinro) edited by Kotsu Kyokyoku Kai.

Extremely useful statistical data were obtained from the Basic Data List for National Land Use Planning. It is no exaggeration to say that almost all necessary data are embodied in this thin booklet. The data, collected and arranged with exemplary clarity and concision, have made this study much less difficult. Also, Prefectural Powers and Potentials (Minryoku) was the most useful source for judging prefectural differences in terms of income, industrial output, cultural and educational levels, living environments, etc.

At any rate, statistical and qualitative analysis of information obtained from these various sources yielded some tentative conclusions, principal among which was that the Shinkansen cannot be expected, in and of itself, to effect the positive changes hoped for by residents along proposed routes and counted on by visionary government agencies. However, it can be of enormous value in furthering these objects if its development is paralleled by concerted action in other spheres.

D. Definitions of More Significant Names and Terms: The Japanese Archipelago - The Japanese Archipelago consists of four main islands-- Hokkaido, Honshu, Shikoku, and Kyushu (See Map I-0) and approximately four thousand other small islands. The total area is 377,535 square kilometers which is more than 10 percent smaller than the State of California in the United States. Its shape is something like a large arc and stretches from the northeast to southwest over three thousand kilometers. The Japanese Archipelago belongs to the circum-pan-Pacific

orogenic zone, and has many steep mountains and swift-running rivers. Some of these mountains are over 3,000 meters in elevation. Population is 111.9 million persons as of 1975, and density of population for total territorial area is 287 persons per square kilometer, which places Japan fifth among the eight-most developed nations (the United States, Canada, France, West Germany, Belgium, Holland, Great Britain, and Japan); however, the density of Japan's population on habitable land is 929 persons per square kilometer, or 28 times of that of the United States and almost 2.5 times of those of Holland, Belgium, and West Germany.

Japan is composed of one metropolitan prefecture (TO in Japanese); one special prefecture (DO); two urban prefectures (FU), and 43 common prefectures (KEN). Also, Japan is customarily divided into ten districts, or regions, or blocs. Those districts, regions, and blocs are Hokkaido, Tohoku, Kanto (Shuto), Hokuriku, Chubu, Kinki, Chugoku, Shikoku, Kyushu, and Okinawa (See Map I-4).

The Three Greatest Metropolitan Areas. - The Tokyo Metropolitan Areas which consists of Tokyo metropolitan prefecture (Tokyo TO in Japanese), and three other common prefectures--Chiba (Chiba Ken), Kanagawa (Kanagawa ken), and Saitama (Saitama Ken); the Nagoya Metropolitan Area which consists of Aichi and Mie prefectures; and the Osaka Metropolitan Area, which consists of Osaka and Kyoto urban prefectures (Osaka Fu and Kyoto Fu) and Hyogo prefecture, are generically called the Three Greatest Metropolitan Areas (See Map I-5).

The Tokaido Megalopolis - The term "Tokaido Megalopolis" was advocated by Kenzo Tange of the University of Tokyo and became very popular in expressing the consolidated area of the afore-mentioned three greatest

metropolitan areas along the Pacific coast. The name "Tokaido" came from the main highway in the feudal age which connected Edo, the former name of present Tokyo and Osaka. Almost a half of the population of Japan is living in this area, and over sixty-five percent of the total industrial output of Japan is centered here (See Map I-6).

The Pacific Coast Belt Industrial Zone (Taiheiyo-gan Beruto Kogyo chitai in Japanese)--The development of the Japanese economy in the 1960's brought about a very high concentration of heavy and chemical industries in the Keihin (Tokyo - Yokohama), Chukyo (Nagoya-Yokkaichi), and Hanshin (Osaka-Kobe) industrial zones. In order to avoid further concentration of industries in these three areas, the Japanese government set out this conception, and guided new establishment plants and equipment into the areas between these three areas; that is, this conception is to make linear industrial zone along the Pacific coast (See Map I-7).

The New Trunk Express Railway (The Shinkansen)--The Shinkansen is defined as follows by the law (Laws for Construction of Nationwide New Trunk Express Railway). The Shinkansen has to:

- (1) run the major section of the designated route with a speed of 200 kilometers per hour or more; and
- (2) be major trunk lines; that is, if some trains run branch lines with speeds of 200 kilometers per hour or more, those trains are not called "the Shinkansen."

The Law for Construction of Nationwide New Trunk Express Railway (Shinkansen Seibi Ho)--This law was enacted on May 13, 1970. It pronounced the necessity of the construction of nationwide Shinkansen lines, formally recognizing the significance of the high-speed railway transport system upon a comprehensive and ubiquitous development of the

national land. The total length of the proposed Shinkansen of 7,200 kilometers authorized by this law is now being reviewed from socio-economic and environmental viewpoints, and is likely to be reduced to 30-40 percent of the original plan.

The Shinkansen Pollution (Shinkansen kogai)--Noise and vibration caused by the high speed of the Shinkansen have long constituted a serious environmental disruption for the residents along the route. On June 29, 1975, the Environmental Agency of Japan settled the standard for the Noise level of the Shinkansen, and assigned the performance of this standard to the Japanese National Railway.

I. THE NATURE AND BASIC FEATURES OF THE HIGH-SPEED RAIL TRANSIT SYSTEM

The Japanese government and the Japanese National Railways are building three new high-speed rail transit service systems to run through the northern part of Japan. Those are the first stage of the Tohoku Shinkansen from Tokyo to Morioka, the capital of Iwate prefecture which is 300 miles north of Tokyo; the Joetsu Shinkansen from Tokyo to Niigata, the largest city on the coast of the Japan Sea, 170 miles northeast of Tokyo; and the Narita Shinkansen from Tokyo to Narita, the city (40 miles east of Tokyo) where the New International Airport is being constructed (See Map I-2). Of the Japanese National Railways, the Tohoku and Joetsu Shinkansens are nothing but a link in the chain of the Shinkansen service system which is now being operated between Tokyo and Osaka, the second largest city of Japan, 350 miles west of Tokyo (the Tokaido Shinkansen), and its extension to Fukuoka, the capital of Fukuoka prefecture and the largest city in the Kyushu island, the southernmost main island of Japan (the Sanyo Shinkansen) (See Map I-1).

However, as a consequence of the phenomenal success of the Tokaido Shinkansen with its swiftness and mass carrying power, the Japanese government has decided to utilize this system to resolve the problems of regional differences, and at the same time, to resolve urban and rural problems which Japan has long been troubled with. Accordingly, the Japanese government enacted the "Law for Construction of Nationwide High-Speed Railways" in 1970, and decided to build a high speed rail transit system with a total network length of 7,200 kilometers throughout Japan (See Map I-2). Specified as parts of this project were the first stage of the Tohoku Shinkansen; the Joetsu Shinkansen and the Narita Shinkansen (These lines are shown as "lines under

construction" on Map I-2); and the second stage of the Tohoku Shinkansen, and the Hokkaido Shinkansen (these lines are shown as "lines to be constructed" on Map I-2). Construction of the Tohoku Shinkansen and Seikan tunnel (between the Honshu and Hokkaido islands - See Map I-0 and I-2), which will be the longest undersea tunnel in the world after its completion, was started in 1971.

A. Progress of Construction. Looking at the record of construction progress of the Tohoku and Hokkaido Shinkansens, it must be concluded that the completion date is far from certain. The first stage of the Tohoku Shinkansen should have been completed in 1976 according to the original plan; progress has been seriously delayed by such occurrences as severe recession in the wake of the oil embargo in 1973 and concerted actions by the resident along the proposed line, especially the residents in Tokyo and Saitama areas, against the building of the Shinkansen for environmental reason. As of August, 1976, the Tohoku Shinkansen (the first stage) was 54 percent completed, and the Seikan tunnel, 31 percent. It is assumed that the first stage of the Tohoku Shinkansen will be finished on or after 1981, and the second stage of the Tohoku Shinkansen, with the Hokkaido Shinkansen, including the Seikan tunnel, on or after 1984.

B. Expected Derived Impacts. These two Shinkansens, the Tohoku and Hokkaido, will shorten the time-distance between Tokyo and Sapporo drastically. The required time between Tokyo and Sendai; Tokyo and Aomori; and Tokyo and Sapporo will fall as shown in the following table:

Tokyo — Sendai	4 hours — .67 hours
Tokyo — Aomori	8.5 hours — 3.33 hours
Tokyo — Sapporo	6.5 hours — 5.83 hours

Inevitably, this drastic shortening of the time-distance will generate some heavy impacts on the current status quo of many fundamental social, economic, political, human settlement, natural resource and other environmental components and conditions. Not only will time-distances fall between regional core cities and big metropolitan centers, and between these core cities; but the social and economic condition of the here-to-fore remote prefectures will substantially be altered.

Also, the possibilities of the development of the Tohoku and Hokkaido, considering their relatively low density of population, and fairly extensive arable lands, could be made realities by the Shinkansens, and the realization of development will make these two districts to play a significant role for future Japan. On the other hand the population of the Tokyo Metropolitan Area, which is composed of the Tokyo metropolitan prefecture and three other prefectures (Saitama, Chiba, and Kanagawa--See Map I-5) has reached over 26 million in 1975. This unbalanced distribution of population has been the most crucial problem in Japan in the post World War II era. It has induced a lack of development of social overhead capital in urban areas (See Chapter II, Section C, Item I: Overpopulation) and severe depopulation in rural areas (See Chapter II, Section C, Item II: Depopulation). Accordingly, another positive impact such as an acceleration of the dispersion of population from the Tokyo Metropolitan Area is strongly expected from the development of these two Shinkansens.

C. Arguments Concerning the Development of the Shinkansen. Despite these strong expectations, the impacts of this sort of high-speed rail transit system have long been controversial among planners, economists, sociologists, environmentalists, government officials, and the residents

along the Shinkansen concerned. Some have strongly stressed the positive impacts of this system--the shortening of time-distance, retrenchment of energy, and the enhanced safety, and others have cited the negative effects such as vibration, noise, and the strong "counter-flow" effect for rural areas. Also, some say that this sort of high-speed rail transit system will no longer be needed in the coming age of stable economic growth, while on the contrary, others believe that this sort of high-speed rail transit system will greatly contribute to conservation of energy, help resolve regional differences, and mitigate over- and depopulation in contemporary Japan, even in an age of stable economic growth. Summarizing these opposed views, supporting arguments mainly come from the local governments and business circles and counter arguments come primarily from environmentalist scholars in planning fields who have special concerns about growth controls, economists who advocate low-economic growth, and residents along the proposed routes of the Shinkansen.

Local people's expectations for the Shinkansen are extraordinarily optimistic. This tendency is conspicuous even among the residents along the Tohoku and Hokkaido Shinkansens. Many people consider this high-speed train service as the realization of a long-fostered desire of the Tohoku and Hokkaido regions since the Meiji Restoration in 1868. They assert that, since the establishment of the Meiji Government by the Emperor Meiji and revolutionary factions (mainly composed of the western clan lords and their retainers), the northern areas which had been in the opponent camps, the Tokugawa Shogunate camps, have been left far behind in the progress of socio-economic development. These claims may at first seem unjustified since the rice price policy of

succeeding Japanese government (which has progressively raised the price of rice) has operated to elevate the average income of the residents of these areas to a figure well above that in the western prefectures. However, in terms of industrialization, which is relatively underdeveloped in the north, the claims are correct; furthermore, accompanying the burgeoning agricultural productivity of the region, there has been an increasingly severe oversaturation of farm workers, which--exacerbated by the thin industrial development--has induced a large population overflow into the urban areas, especially the three greatest existing industrial areas, Keihin (Tokyo Yokohama), Chukyo (Nagoya-Yokkaichi), and Hanshin (Osaka-Kobe) areas. Although, as mentioned above, their prefectural powers (Minryoku in Japanese), which are calculated from 24 social and economic indicators, are higher than many of prefectures in the western area of Japan, judging on the national level, each prefecture's Minryoku in the Tohoku and Hokkaido districts is relatively low.

The expectations of local people may be summarized as follows. The Tohoku and Hokkaido Shinkansen will:

- (1) stimulate fairly large-scale private and public investments, especially in the field of inland-type industries and also these industries will strongly contribute to the reformation of present industrial structures from the primary to the secondary and further to the tertiary levels;
- (2) bring about undeveloped potentialities of the Tohoku and Hokkaido districts which are blessed with a fairly large flat land suited for cultivation in proportion to less population;
- (3) stimulate tourist development, which will enrich local finances;

- (4) diminish social and cultural differences between these areas and urban areas;
- (5) directly enrich local finances by numerous investments for the construction per se; and
- (6) as a whole, enlarge economic and marketing sphere of these areas, and will be able to slough off from traditional low-wage structures in these areas.

The forces of opposition are not without counter-arguments, however, chief among the dissenting views are the following.

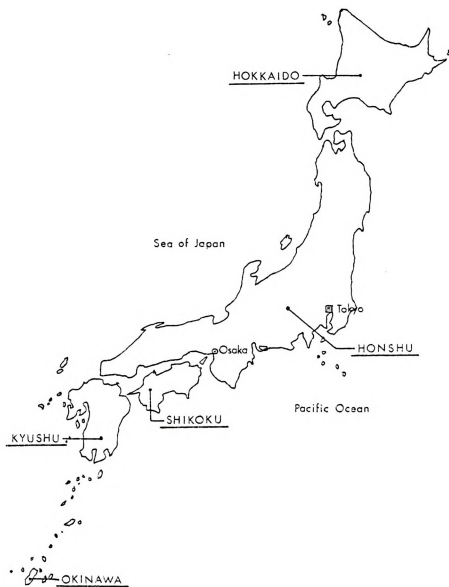
The Tohoku and Hokkaido Shinkansen will:

- (1) be unprofitable, because this sort of mass, high-speed railway transport system is only feasible in densely populated areas;
- (2) suffer from seasonal fluctuation of their carrying capacities because of heavy snow in these areas;
- (3) induce disordered development by only profit-oriented developers and realtors. (In fact, it is rumored that speculators have already bought up the greater part of properties not only around stations which have been definitely planned or constructed for the Shinkansen, but even in commercial and business districts of local core cities where Shinkansen stations are only tentatively projected);
- (4) induce the destruction of local capitals;
- (5) have serious negative environmental impacts; and
- (6) cause a counter-flow effect toward the Tokyo Metropolitan Area.

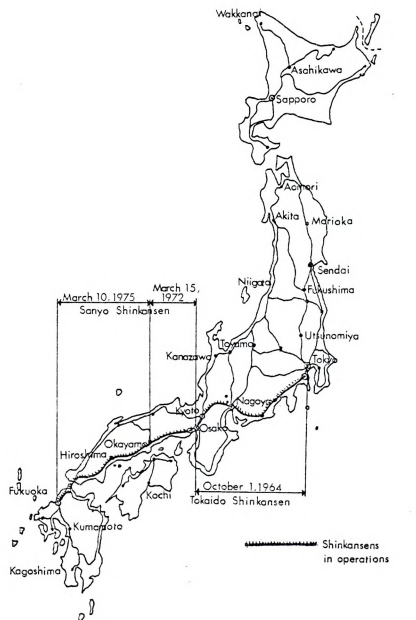
This is a bare summary of criticisms; there would certainly be others. Since the Japanese economy experienced a severe recession, the contra-arguments have held the advantage. However, the construction is

making steady progress every day. What ramifications can be expected from the development of a high-speed transport system within relatively underdeveloped areas? If positive impacts can not be expected from the development, are there any alternatives or policy recommendations for the development concerned?

In the next chapter, a brief history of the formation of regional socio-economic society in Japan will be introduced. It will greatly contribute to the understanding of problems which Japan has long been troubled with, and at the same time, will be great help for understanding the impacts of the Shinkansen correctly.

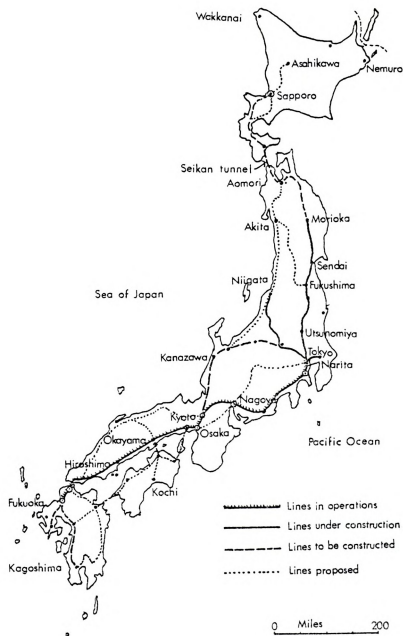


Map I-0: Japan with four main islands & Okinawa island



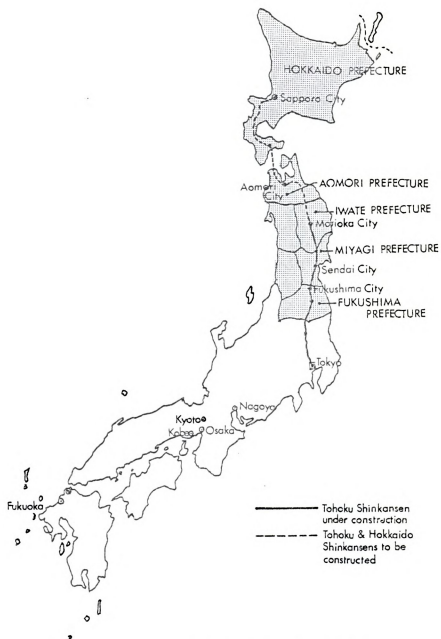
Map 1-1: Tokaido & Sanyo Shinkansens

0 Miles 200

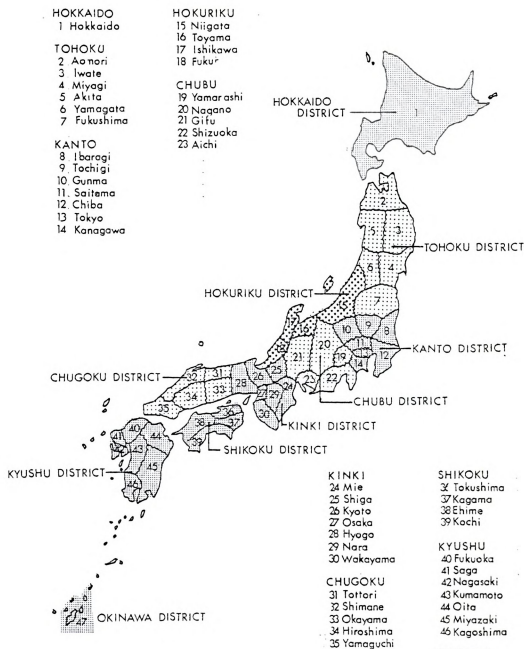


Map 1-2 Nation-wide Shinkansen Network in the 2nd National Comprehensive Plan

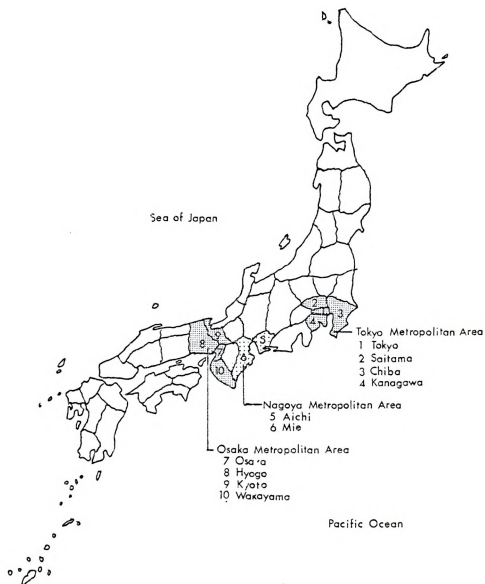




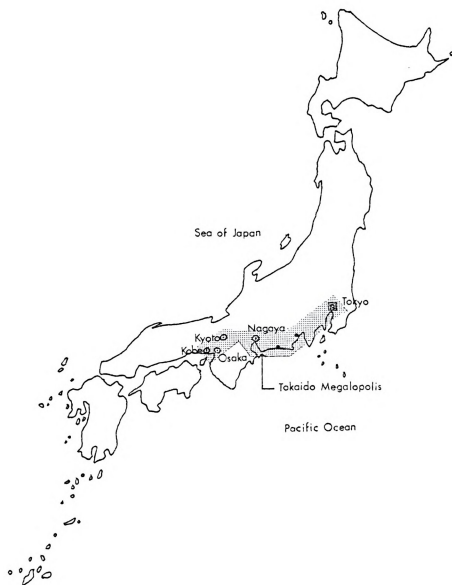
Map 1-3: Prefectures & Cities in the Tohoku & Hokkaido Districts Visited & Interviewed



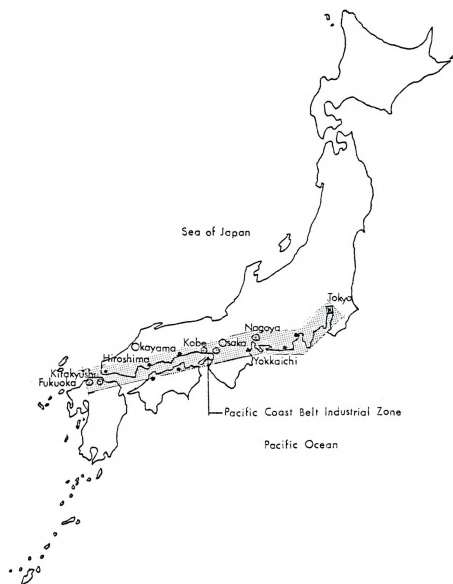
Map 1-4: 47 Prefectures & 10 Districts in Japan



Map 1-5: The Three Greatest Metropolitan Areas



Map 1-5: Tokaido Megalopolis



Map 1-7: Pacific Coast Belt Industrial Zone

II. THE EVALUATION AND FORMATION OF THE REGIONAL SOCIO-ECONOMIC SOCIETY

The Policy of Seclusion over three centuries beginning in the 1630's, and various political, administrative, and economic measures enacted by the ruling structures then in power, had enormous influence on the formation of regional socio-economic society in Japan. Further, drastic policies taken by the Meiji government for the modernization of Japan since 1868, such as the policy of "Fukoku Kyohei" (a plan for building up a rich country with a strong army) and various coercive measures for the industrialization enacted by successive governments, as well as strong measures for the promotion of heavy and chemical industries after the Second World War, have given rise to the formation of Japan's unique regional social and economic society. Also, it has been widely said that the development of the New Trunk Express Railway system in 1964 has enormously contributed to the formation of the so-called "overpopulated" regional society along the Pacific Coast. And now, further developments of the New Trunk Express Railway System are being constructed or planned in the so-called "rural" areas. What kinds of significant impacts upon rural areas can be expected as a result of these developments? In order to further understand the possible impacts of the New Trunk Express Railway, a clearer understanding of the process of the formation of Japan's unique regional society is needed. This process is described in this chapter in the following order:

Section A - History of the Formation of the Regional Socio-Economic Society (1603 - 1945);

Section B - Rapid Socio-Economic Growth after the Second World War and the Formation of Contemporary Regional Social Economy;

Section C - Stresses Generated by Vigorous Economic Growth:

A. History of the Formation of the Regional Socio-Economic Society

1. The Formation of the Pre-Modern Regional Socio-Economic Society - The Tokugawa Period (1603 - 1867):

Up until the early seventeenth century, Japan could not have been called a self-ruled nation in any real sense. The sovereignty has held by the Emperors from the third century up to the eighth century; by the influential nobilities up to the twelfth century; and by the warrior lords up to the late fifteenth century. However, the sovereignties of those rulers did not usually cover the entire nation; and when they did, their foundation was very fragile. In fact, the struggles for supremacy were fierce, and usurpations were every day affairs. Further, it is more than likely that ruling structures were chiefly used for self-aggrandizement by the successive regimes. Certainly the Tokugawa Shogunate's political and administrative structures were the most organized and powerful in the pre-modern age. The Tokugawa Shogunate enacted a number of drastic policies to control and rule the entire nation, many of which had great impacts upon the formation of the pre-modern socio-economic society. Among these, extremely noteworthy policies were:

- (1) "Policy of Seclusion (Sakoku in Japanese)" from 1633 to 1854;
- (2) "Policy of Hostage System or System of Alternative Residence (Sankin Kotai); and
- (3) "Policy of Agricultural Furtherance."

(1) Policy of Seclusion - From 1633 to 1854, the Tokugawa Shogunate had closed the door of Japan to foreign countries except Portugal at the beginning of the seclusion and Holland, which superseded Portugal after 1639. The Shogunate built a man-made island in the Nagasaki Bay

in the northern Kyushu district in 1641, and accommodated all Dutch people in this island, segregating them from the public at large. The reason the Shogunate continued trade only with Holland was that only Holland among Western nations engaged in trade without missionary Christianity.

There were two primary reasons why the Shogunate finally insisted on the Policy of Seclusion. One was the misgivings and fears associated with Christianity because of its strict exclusivism; a menace was felt due to the solidarity of Christians. The other was the same feelings about wealthy local clans and influential merchants who might have more power to overturn the Shogunate through international trade. In fact, these fears were not unfounded, because after opening the country in 1854, it was not long before the Shogunate was overthrown by local clans which were strongly tied to wealthy and influential merchants.

The success of seclusion over almost three centuries must have been largely a matter of luck. Because of its location in a remote corner of the world, Japan could at that time be free from the colonial policies of the World Powers.

There are two opposite opinions concerning the Seclusion. One is an affirmative view that the seclusion protected Japan from domination of the World Powers, and allowed for the cultivation of Japan's own culture and civilization. The other opinion, of course, is that social and economic developments fell far behind because of Seclusion. Both have some reason. Artifacts representing Japan's distinctive culture, such as pottery, lacquer ware, silk goods, Japanese paper, etc. were refined in this period. Also, such arts as Kabuki dance, Noh play, Ukiyoe painting, Haiku (a seventeen syllable poem) reached their

culminating phases of development. In the spiritual realm, "Zen" was fully developed. Hence, the influence of the Seclusion on Japan was not negative in all aspects. Judging from social and economic developments, however, during the three centuries of the Seclusion, Japan was at a fairly primitive level. The "Catching Up" policy of the Meiji Government after opening the country was to close the gap between Japan's primitive level of industry and the advanced level of developed countries; but social development, especially the improvement of the environment, was forgotten. Various stresses resulting from the official policy in the Meiji era still remain in contemporary Japan.

(2) Policy of Hostage System ("Sankin Kotai") After the civil war's victory in 1600, Ieyasu Tokugawa, the lord of the Tokugawa family, established his Bakufu (the Shogunate Court) in Edo (now Tokyo), in 1603, and after decisive victories from two other civil wars with old powers in 1614 and 1615, he subjugated all of Japan. The Shogunate placed a number of commercially, industrially, and strategically important areas under its direct jurisdiction to secure the financial and strategical stability of these areas, and simultaneously distributed "Daimyos" - the feudal lords who were about two hundred and sixty in number at the end of the Tokugawa period - all over the nation. The Shogunate located "Fudai Daimyos" - Daimyos in hereditary vassalage to the Tokugawas - in peripheral areas of Edo and Osaka and other important strategic places, and "Tozama Daimyos" - Daimyos who became vassalage after the civil war in 1615 - in remote places. Further, the Shogunate required Daimyos to spend part of their lives in Edo, and forced their wives and children to live in Edo as part of a kind of hostage system. Daimyos had to go up to Edo every other year to

pay their respects to the Shogunate. Expenses for this travel and maintenance for two residences in Edo and their own domains, including their retainers' residences, became burdensomely high, and aggravated Daimyos financial conditions. The prime object of the system of the "Sankin Kotai" was to impoverish the Daimyos, and in this aim, the Tokugawa Shogunate was successful. On the other hand, the "Sankin Kotai" yielded many bi-products that were influential in the later developments of Japanese society. The improvement of highways, the establishment of barrier stations along highways for strategical reasons, the development of post and port towns and especially castle towns, were bi-products of this policy. The rapid improvement of highways stimulated the exchange of commodity goods and special products of various districts throughout the nation. (The names of such main highways of the time as the Tokaido, Edo-Osaka, and Sanyodo, Osaka-Shimonoseki, the southernmost city in Houshu Island, have been adopted by JNR's railway.) Producers brought their products to castle towns, and exchanged them for other goods. Gradually, merchants intervened in the trading process, and the barter economy shifted to a monetary economy. With the advance of the monetary economy, castle towns burgeoned. Daimyos accommodated merchants and craftsmen in their castle towns, and encouraged commercial and industrial activities. Among these castle towns, Edo and Osaka enjoyed particular prosperity. At the beginning of the eighteenth century, Edo already had a population of over 1 million, and Osaka had over 350,000. Edo was called the "Fine City of Edo," and Osaka was called the "Kitchen of the Whole Nation."

Besides these castle towns, such port towns as Sakai, Kobe, Niigata, and Hakata prospered as the bases of domestic maritime trades; Sendai,

Kawasaki, Hamamatsu, Utsunomiya, and Nagano developed as typical post towns. All of these cities still play a significant role in contemporary Japan as centers of either industrial or commercial activities. Hence, during this term, the basic layout of contemporary cities in Japan was shaped. Further, regional characteristics emerged in the field of manufacturing industries. For instance, silk goods developed in the Kinki and Kita-Kanto districts; pottery, in the Kita-Kyushu and Chubu districts; lacquered ware, in the Tohoku district; Japanese paper, in the Chubu and Hokuriku districts; breweries, in the Kinki and Tohoku districts. However, the industry that flourished in the first half of this period could best be described as agrarian home industry, and only in the latter half of the Tokugawa period (1603 - 1867) did anything like commission-type home industry which middlemen deeply intervened begin to appear.

(3) Policy of Agricultural Furtherance - In the Tokugawa period, the amount of a fief's stipend was expressed by the amount in terms of the "koku." The "koku" is a unit of volume of grain and lumber in Japan. One "koku" is equivalent to either 5.119 U.S. bushels in grain or 9.827 cu. ft. of lumber. All warrior lords' stipends were allotted by the Shogunate with "koku" in rice. Those who were allotted the fief which has the capacity of the production of rice more than 100,000 koku per year were called Daimyos. Rice, then, was the most important foundation for feudalism. Not only the Shogunate, but also local lords took great interest in the development of reclaimed rice fields. As a result, the total arable lands at the middle of the eighteenth century reached 3 million hectares, which was "double" of 1.5 million hectares of arable land at the end of the sixteenth century, and the total

increased to 4.5 million hectares in 1872 when the Meiji Government reformed the land tax system. During this term, agricultural technology also made rapid progress, and the productivity of agriculture improved considerably. However, with the development of the monetary economy, merchants gradually extended their financial power into agriculture; by degrees they displaced primary landlords and became "parasitic" landlords. This phenomenon, the increase of exploitation by commercially shrewd middlemen, naturally resulted in an important reduction of taxes collected by agents of the Shogunate; however, even the power of the Shogunate could not prevail against it. The existence of parasitic landlords continued until the agrarian reform after World War II, and after the Meiji era (1868-on), these landlords became masterminds of Japanese militarism.

This change in land proprietorship, in combination with frequent crop failure and famine, eventuated in the impoverishment not only of farmers but of every interest (excepting the new landlords) economically concerned with agriculture--the Shogunate, the nobility, local lords, warriors, priests, etc. In effect, then, the development of commerce, because it ushered in the new middleman component of Japanese agriculture, substantially contributed to the demise of feudalism.

However, in spite of various adverse conditions, agricultural production continually expanded. Up until the beginning of the twentieth century, agriculture was to maintain its primacy as the main activity of Japan.

2. The Formation of the Modern Regional Socio-Economic Society-- From the Meiji Restoration to the End of the Second World War:

Until the Meiji Restoration (1868) - Since the end of the eighteenth

century (1792), a fair number of foreign ships and envoys had shown up on the coast of Japan, and inevitably tensions increased in the relations between localities of Japan and the foreigners. In many cases, the military power of regional clans were no match for the machine technology and fire power of these foreign ships. The Shogunate actually realized these powers and decided to open the country in spite of anti-alienist groups' opposition. In 1854, the Shogunate yielded to the pressure of the United States, and concluded a Japan-U.S. Peace Treaty. This Peace Treaty and the succeeding Japan-U.S. Amity and Commerce Treaty in 1858 were considered humiliating by many in Japan, and aroused the wrath of the local clans, especially clans in the western part of Japan. Ultimately (in 1867), these local clans joined forces under the Imperial standard and overturned the Shogunate, which had reigned over Japan for three centuries.

The Meiji Restoration - In 1868 the Meiji Restoration was completed, and the Emperor Meiji settled the Capital of Japan in Edo, renaming it Tokyo. From this year, Japan was reborn as a modern nation out of the former feudal confederation.

Immediately, the Government abolished 260 or more feudal fiefs and settled 75 new prefectures, including 3 urban prefectures, Tokyo, Osaka, and Kyoto. In succession, the Government appointed government authorized governors and sent them to newly established prefectures to replace former lords of local clans once appointed as temporary governors: by a successful enforcement of this drastic policy, the base of the Meiji Government was strengthened; and Japan began to move toward centralization. The Government activated important new policies in rapid succession: the abolition of barrier stations from highways,

the revision of the land tax system from payment in kind to payment in money, and the abolition of the law against land trade.

Anti-alienists had been hushed at this time, and the Government positively pushed forward the opening country policy, actively absorbing developments of western civilization, such as the steam engine.

On the other hand, the Government entertained some misgivings about the World Powers' policies toward Asia; consequently, it adopted the policy of the "Fukoku Kyohei" (A plan for building up a rich country with a strong army). The Government's vigorous immediate introduction of the steam engine was due to its understanding that this technology was one source of the strength of the World Powers; the railway system was imported en toto from England. In 1872, the first railway service was inaugurated between Tokyo and Yokohama, the gateway port of Tokyo. Further, the Government established government-managed arsenals in Tokyo and Osaka, shipyards in Nagasaki and Yokosuke, and filatures in Tomioka of Gunma prefecture in the Kanto districts; and also encouraged private industrial activities. The Government dealt with the war material industry quite actively, and as a result, the machine industry developed rapidly. Through her victories in two modern wars with China and Russia in 1894 and 1904, respectively, Japan entered into the family of the World Powers; however, the base of Japanese industry at that time was still a light industry (notably textiles); it was very fragile compared to other World Powers.

The First World War - The First World War considerably contributed to the modernization of Japanese industry. The Maritime transport business and shipbuilding industry boomed, and formed the base of the Present shipbuilding Kingdom of Japan; the steel and iron and chemical

industries enjoyed unprecedented expansion. Just before this war, the Government established the Yawata Iron Mill in Yawata in the Kita-Kyushu district, and this mill was to become the forerunner of the present Japanese steel industry. As a result of this war, industrial products for the first time superceded agricultural products. It may safely be said that Japan entered into the family of industrial nations with this war as a momentum (See Figure II-1).

From the end of World War I to the beginning of World War II, Japan was ceaselessly beset by troubles--the Kanto earthquake, a banking panic due to the earthquake, successive recessions after the banking panic, the collapse of parliamentarism and a rise of militarism; and, internationally, the World's financial panic and the World Powers' intervention in Japan's Asian policy. In the field of planning, the influence of the Kanto earthquake must be mentioned before everything else. In 1923, Tokyo and its peripheral area were visited by an extraordinarily destructive earthquake, which devastated residences, buildings, and industries. 570,000 housing units were either razed or burnt. Fatalities numbered 130,000. Pivotal administrative functions, which were concentrated in Tokyo at that time collapsed in a single day. The banking panic and recession following the earthquake caused business cartel, the organization of trusts among industries, and capital export to such countries as Manchuria, Korea, and Taiwan. Gradually, monopoly capital was formed, and concomitantly powerful banking institutions which were strongly tied to this monopoly capital.

It has long been said that this earthquake must have been a golden Opportunity for remodeling Tokyo; however, the lack of funds, and the

lack of readiness in the Government to undertake such ambitious reconstruction lost this golden opportunity forever. However, Tokyo itself, phoenix-like, did recover economically from its severe damages, and in 1942 its population attained its pre-World War II peak of 7.36 million.

The Second World War - In 1940, Japan actually allotted as much as 63.8 percent of its national budget to military expenditures (in comparison, "defense-related expenditures" in the post war year of 1960 were only 5.9 percent of total governmental expenditures). During this war, Japan lost the greater part of its key industrial power, and also suffered depletion of human resources. A distribution control was imposed on food, clothes, and even soap. Almost all major cities were exposed to the Allied Forces' bombing, and people were relocated voluntarily as well as by force to the countryside. For instance, Tokyo's population in 1945 (3.5 million) was just half of its population in 1942. Tokyo recovered from this second ordeal; however, again, it lost its "golden opportunity" in the wake of defeat.

Although the so-called "miracle" recovery of the Japanese economy is discussed in detail in the next section (B), the introduction of various indices of industrial activity before and immediately after World War II, and those indices at the present time will be useful to illustrate just how quickly the Japanese economy did recover.

Table II - 0
Transition of Primary Indices
(before and immediately after WW II)

	Before WW II (A)		Immediately After WW II (B)		At the Present Time (C)	
	As of	Figures	As of	Figures (B/A)	As of	Figures (C/B) (2)
Total of National Land		681,013 km ²	1945	369,855 km ²	1972	377,389 km ²
Population (1)	1935	6,866,000	1947	7,810,000	1970	10,372,000
National Wealth (1)	1935	trillion ¥	1945	trillion ¥	1970	trillion ¥
GDP (average between)	1925-35	21 trillion ¥	1946	22 trillion ¥	1973	302 trillion ¥
GDP per capital	1925-35	11,300 ¥	1946	7,600 ¥	1973	90,829,000
(average between)		103,000 ¥		103,000 ¥		829,000
Gross Domestic Fixed Capital Formation of government	1925-35	billion ¥	1946	billion ¥	1973	billion ¥
		360		692		8,074
Rice Production	1939	10,345,000t	1945	5,879,000t	1973	12,149,000t
Production Index in Manufacturing Ind.	1925-35	(1.0)	1946	(0.33)	1973	(22.60)
Pig Iron Production	1942	4,256,000 t	1946	203,000t	1973	90,007,000t
Coal Production	1935	37,800,000t	1945	20,400,000t	1973	20,900,000t
Electric Power	1935	5,760,000kw	1945	10,390,000kw	1974	104,200,000 kw/person--
Electric Power Consumption per capita	1935	283	1945	228	1974	4,170
Freight Transportation	1943	billion ton	1946	billion ton	1974	billion ton
		km, 43.4		km, 19.1		km, 376.5
Automobile Registration	1943	180,000	1947	200,000	1973	25,962,000
Maritime Tonnage	1936	3,170,000t	1945	110,000t	1975	32,530,000t
						295.73

Table II - 0 continued

	Before 2nd II (A)		Immediately After 2nd II (B)		At the Present Time (C)	
	As of	Figures	As of	Figures	As of	Figures
Rice Price Average	1925-35	Witter 0.20	1946	Witter 2.0	1974	Witter 197.8
Wage, Labor in manf'g.	1935	Witter/month 56.5	1946	Witter/month 443.2	1974	Witter/month 176.464
Land Price for Housing	1936	(1.0)	1946	(6.0)	1974	(8.591)
Wholesale Price Index	1937	(1.0)	1946	(16.3)	1974	(608.7)
Consumer Price Index	1937	(1.0)	1947	(109.1)	1974	(882.4)
						8591.00
						608.70
						882.40

NOTE: 1 - The Price in 1970

2 - This ratio was figured by this writer.

SOURCE: Basic Data List, p. 34.

B. Rapid Socio-Economic Growth After the Second World War and the Formation of Contemporary Regional Social-Economy:

1. Rapid Socio-Economic Growth After the Second World War:

Out of the ruins of a devastating military defeat Japan has dramatically risen to the position of being the fastest-growing nation in the world. This resurgence of the Japanese economy has been called variously a "miracle," a "mystery," and a "legend."

Right after World War II, the Japanese Gross National Product (GNP) descended to 69 percent of the average pre-war GNP between 1926 and 1935, and per capita income dropped to 28 percent of the pre-war figure (1934-35). A vanquished Japan had to start from scratch, although there had been some assistance from the benevolent American occupation forces. As is well known, the Korean War (1950-53) played an epochal role for the post-war Japanese economy. As a supplying base for the Allied Forces, Japan greatly contributed to the war, and received important benefits in return. During the term between 1946 and 1953, the rate of the growth of Japanese GNP averaged 11.0 percent yearly. Hence, the industrial capacity of Japan regained its pre-war level. After 1950, the Government poured national funds into such industries as electric power, shipbuilding, and steel; simultaneously, private plant and equipment investment became quite active.

After the Korean War, Japan's economy temporarily stagnated; however, the 1955-62 "liberation period," with all sorts of massive decontrols both at home and abroad, gave renewed impetus to the "catching up" process of Japan's economy. During this term, massive investments were made to renew plants and equipment of steel, machinery, and chemical industries; petrochemical and synthetic fiber industries

also made rapid progress. At the beginning of the 1960's, the former Prime Minister of Japan, Hayato Ikeda, advocated an "income-doubling plan," and Japan enjoyed unprecedented economic growth. Throughout the 1960's, the number of farming households decreased from 6.06 million to 5.34 million, and the working population in agricultural and fishery industries fell to 19.3 percent from 32.6 percent of the total. The coal industry rapidly faded away with the transition to petroleum.

Two noteworthy conceptions were adopted in the "income-doubling plan." Those were the conceptions of "Pacific Coast Belt Industrial Zone" ("Taiheiyo-gan Beruto Kogyo Chitai" in Japanese) and "New Industrial City" ("Shin Sangyo Toshi"). The conception of "Pacific Coast Belt Industrial Zone" was intended to decrease an excessive concentration of industries in three zones, and to distribute new factories and plants along the Pacific Coast down to Kyushu island. The "New Industrial City" was a policy intended to diffuse industries to local cities to dissolve regional differences. Since 1963, fifteen cities were appointed as the "New Industrial City;" however, with only 2 or 3 exceptions, most cities have been compelled to revise their original plans because of the antagonism of the residents and the repugnance of industries, as well as the recent recession. Similarly, the conceptions of the "Pacific Coast Belt Industrial Zone" (See Map I-7) has received some severe checks from environmental interests. For example, asthma in Yokkaichi and Kawasaki, paper sludge in Shizuoka, a red tide in the Seto Inland Sea, etc. are now under indictment. Besides these environmental disruptions, the strain of rapid economic growth has been felt in other ways all over Japan. Today, the Japanese economy has entered

into an age of stable growing. The Nixon Shock in 1971, the Oil Embargo in 1973, and the recession in the wake of the oil embargo have caused stagnation in the Japanese economy.

Public sentiment against economic expansion, unlike anything in the history of Japan's development, has grown influential; and there is an increased popular awareness of the limits of Japan's natural resources and land area. This decade might be the last opportunity to reconstruct Japan for those who will inherit it.

2. Gravitation of Population and Concentration of Industry toward the Three Greatest Metropolitan Areas and the Pacific Coast:

First of all, consider the following figures.

	Incorporated Area	Population	Industrial Output
The Three Greatest Metropolitan Areas	10.5% of the total national land	44.4% of the na- tional population	58.8% of the total national industrial output

These figures well manifest how population and industrial output are unevenly distributed in Japan. Taking the same figures concerning the Tokyo Metropolitan Area, the state of affairs become more drastically serious.

	Incorporated Area	Population	Industrial Output
The Tokyo Metropolitan Area	3.6% of the total na- tional land	23.7% of the na- tional population	28.6% of the total national industrial product

More than 23 percent of the national population is living in only less than four percent of the national land, and producing almost 30 percent of the total industrial output in Japan.

Concentration of Industries to the Pacific Coast - There are many reasons why industries heavily concentrated along the Pacific Coast. First of all, as mentioned before, although its scale was not so massive, the base of the present three greatest industrial zones was formed in the pre-World War II period; accordingly, new plants and factories concentrated to these areas in pursuit of the profits of accumulation. Secondly, by the backwash of the Cold War between the United States and Soviet Union, the trade with countries in the Communist bloc, especially the U.S.S.R. and People's Republic of China was strictly checked and restricted. As a result, the coast of the Japan Sea was at a disadvantage compared to the Pacific Coast. Thirdly, the Pacific Coast was blessed by relatively spacious flatland and big rivers for industrial waters. Lastly, many large and middle-sized cities along the Pacific Coast serve as consumers of industrial products. Hence, such coastal-type process industries as oil refining, chemical, steel mill, shipbuilding, electric power, synthetic fiber manufacturers and so on have located their plants and equipments along the Pacific Coast.

Looking at the productive capacity of basic resource industries in the Three Greatest Metropolitan Areas, the rate of concentration is easily distinguished. During the 5 years (1965-70), in the field of blast furnace pig iron, these three areas produced 45.9 percent of the total production, and if peripheral prefectures are included (in this case, Ibaragi prefecture for the Tokyo Metropolitan Area and Wakayama

prefecture for the Osaka Metropolitan Area), the figure becomes 66.0 percent. Also, in the field of oil refining, the above figures becomes 63.7 percent and 71.9 percent (See Table II-1).

Gravitation of Population Toward the Three Greatest Metropolitan Areas - It goes without saying that the movement of population is generated considerably by economic dynamics, that only where there are better jobs or income will people move en masse. For a few years after World War II, people, whether or not they liked it, had to stay in the countryside, because there were no opportunities to get a decent job and income in urban areas. The Korean War changed this situation drastically. As mentioned before, all major industries were revitalized by this war. People began to move back to urban areas, especially to the three metropolitan areas. From 1950 to 1970, over 10.5 million persons flowed in from rural areas, and 6.33 million settled in the Tokyo bloc; 0.6 million, in the Nagoya bloc; and 2.8 million, in the Osaka bloc (See Table II-2). Also, when the various movements of population are counted for this period--that is, rural to urban, rural to rural, urban to urban, and urban to rural areas--it amounts to more than 113 million persons changing jobs and residence. This means that a population equivalent to the national population of Japan changed their living places; with (it can be assumed) reasons and forms.

Looking at this movement geographically, the Tohoku and Kyushu districts played a main role for people's movement. During this term 1950-70, the Tohoku district lost 2.2 million residents, and the Kyushu district lost 3.1 million (See Table II-2). This exodus of population from these two rural districts caused a problem of depopulation (which is discussed later), especially in the Kyushu district.

However, the tendency of migration has since stabilized, with the term 1960-65 initiating this stabilization. As shown in Table II-3, the number of prefectures with an annual population decrease has been continually less since the term 1955-60, and in 1973 its number became zero. This indicates that the movement of population has gradually declined and population has begun to settle in rural areas. And in recent years, local core cities have become the targets of people's movement instead of the existing metropolitan areas. However, the population of the Three Greatest Metropolitan Areas has still increased because of the natural increase and (though it has become smaller) the social increase from rural areas (See Table II-4, II-5, and Fig. II-2).

Accompanying the change in the migration pattern, two critical problems have emerged. One is the overpopulation problem in and around local core cities, and the other is the population sprawl radiating from 50 to 100 kilometers has been inducing the swelling of local finance, the lack of social overhead capitals within newly residential areas. Further, urban sprawl has occasioned serious commuting problems: it has been estimated that the average on-way commuting time for workers in the Tokyo Metropolitan Area is one hour; and the energy being used for commuting is 409 calories per person on the average, which is equivalent to half the amount of calories of work for official clerks (750-850 calories per person).

Table II - 1
Productive Capacities of Basic Resource Type Industries
during the 5 years (1965-70)

	Tokyo	Nagoya	Osaka	Three Metro- politan Areas	Three Areas & Periphery	Nation
Blast Furnace Pig Iron (1000 ton)	1965 14,980 27.1 2,021 3.7 10,084 18.2 27,085 49.0 30,764 55.7 55,333 100					
	1970 20,848 19.7 7,608 7.2 21,785 20.6 50,241 47.5 64,017 60.5 105,762 100					
Oil Refining (1000 BPSD)	1965 698 33.9 335 16.3 60 2.9 1,093 53.1 1,292 62.7 2,058 100					
	1970 1,350 37.8 365 10.2 340 9.5 2,055 57.6 2,448 68.6 3,569 100					
Ethylene (1000 ton)	1965 339 35.8 233 23.6 0 0 562 59.4 562 59.4 948 100					
	1970 1,649 43.7 423 11.2 220 5.8 2,292 60.7 2,592 68.7 3,774 100					

PERIPHERY -- Ibaragi prefecture and Wakayama prefecture.

SOURCE: Basic Data List p. 54.

Table II - 2
Net Migration in Thirteen Regions of Japan 1950-55 to 1965-70
(in thousands)

Region	1950- 1955	1955- 1960	1960- 1965	1965- 1970
Hokkaido	+44	-50	-177	-282
Tohoku	-474	-584	-677	-451
Kita-Kanto	-336	-344	-178	-32
Minami-Kanto	+1,472	+1,580	+1,917	+1,356
Hokuriku	-496	-421	-397	-322
Tokai	+36	+109	+252	+159
Keihinanshu	+618	+732	+948	+515
Others (Kinki)	-107	-109	-21	+38
Sanin	-62	-117	-128	-88
Sanyo	-136	-212	-184	-44
Shikoku	-237	-297	-278	-183
Kita-Kyushu	-130	-347	-642	-411
Minami-Kyushu	-254	-431	-460	-375

cb: Kitakanto - Yamamashi, Nagano, Ibaragi, Gunma, Tochigi prefectures
Tokai - Aichi, Shizuoka Gifu prefectures
Sanin - Shimane, Tottori prefectures
Sanyo - Hiroshima, Okayama, Yamaguchi prefectures
Kita-Kyushu - Fukuoka, Saga, Nagasaki, Oita prefectures
Minami-Kyushu - Kumamoto, Miyazaki, Kagoshima prefectures

SOURCE: Heide & Udo Simons, eds., Japan, p. 89.

Table II - 3
Transition of Population - Decreased Prefectures

	Prefectures	
	No.	Population Decreased (in thousands)
1950-55	7	60
1955-60	26	692
1960-65	25	1,171
1965-70	20	730
1970-71	19	354
1971-72	14	98
1972-73	9	31
1973-74	4	7
1974-75	0	0

SOURCE: Basic Data List for National Landuse Planning, p. 101.

Table II - 4
Population in the Three Greatest Metropolitan Areas
(in thousands)

	1960	1965	1970	No. of Increase	Yearly Average Growth Rate (%)	No. of Increase	Yearly Average Growth Rate (%)
				1960-65		1965-70	
Total of the Three Greatest Metropolitan Areas (share)	34,960 (37.4)	40,400 (41.1)	45,582 (43.9)	5,440	2.9	5,181	2.4
the Tokyo M.A.	17,864	21,017	24,113	3,153	3.3	3,097	2.8
The Nagoya M.A.	5,691	6,313	6,929	622	2.1	616	1.9
The Osaka M.A.	11,405	13,070	14,539	1,665	2.8	1,469	2.2
Across the Nation	93,419	98,275	103,720	4,856	1.0	5,445	1.1

SOURCE: Basic Data List, p. 46.

Table II - 5
Social Increase and Natural Increase in the Population
of the Tokyo Metropolitan Area

	The Number of Increase in Population between 1960 and 1965 (1,000's)			The Number of Increase in Population between 1965 and 1970 (1,000's)			The Rate of Increase in Population between 1960 and 1965 (%)			The Rate of Increase in Population between 1965 and 1970 (%)		
	Total	Natural	Social	Total	Natural	Social	Total	Natural	Social	Total	Natural	Social
	Increase	Increase	Increase	Increase	Increase	Increase	Increase	Increase	Increase	Increase	Increase	Increase
Tokyo Metro- politan Area	3,153 (100)	1,294 (41.0)	1,859 (59.0)	3,096 (100)	1,632 (52.8)	1,464 (47.2)	17.6	7.2	10.4	14.7	7.8	7.0

SOURCE: Basic Data List, p. 46.

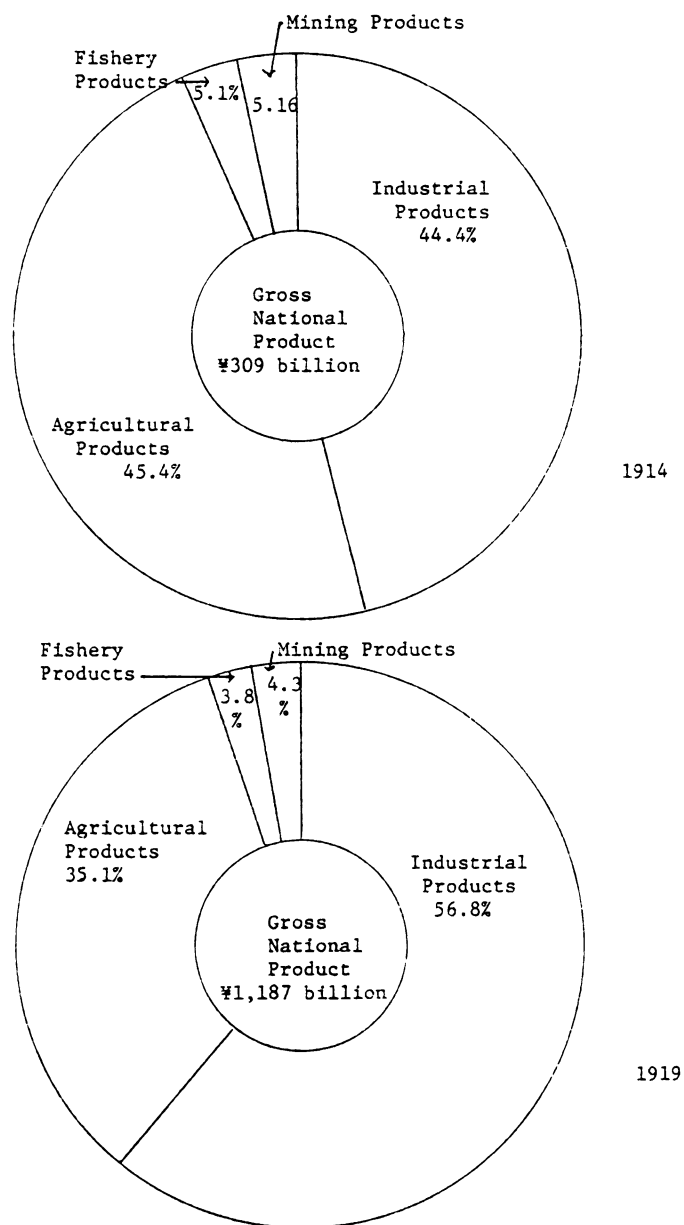


Figure II-1 - Change in Industrial Products Between 1914 and 1919

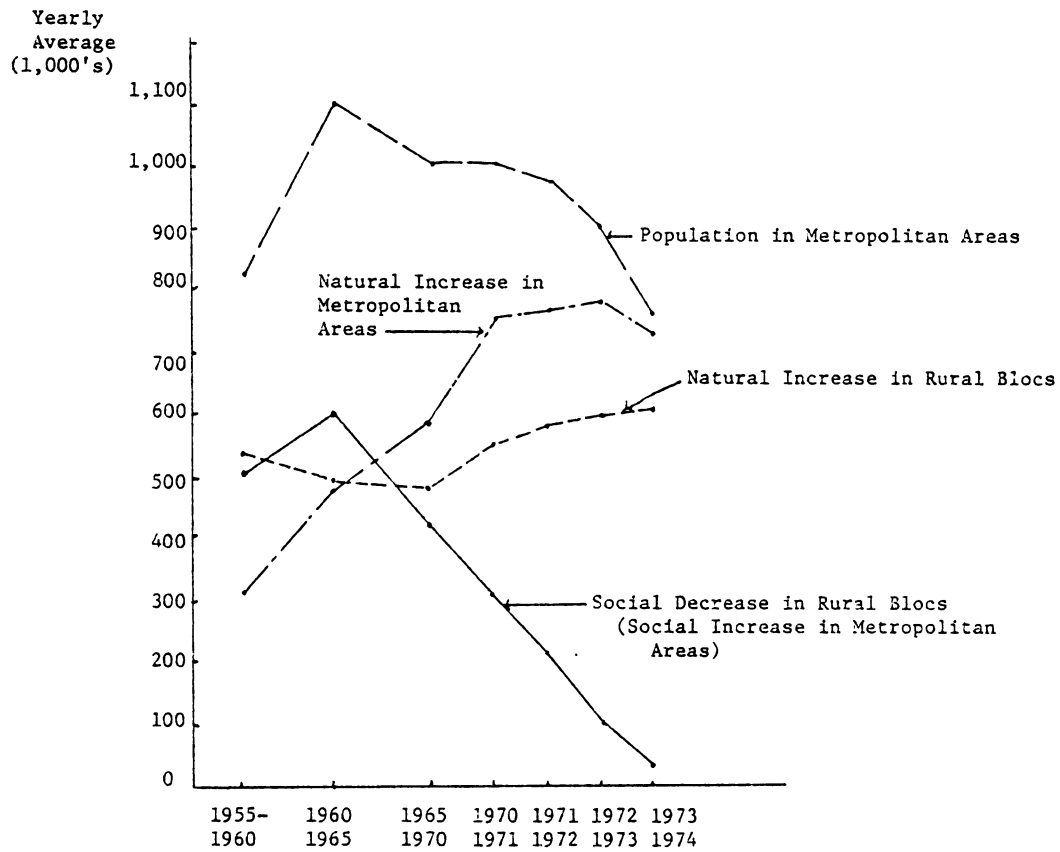


Figure II-2 - Movement of Population in Rural Blocs and Metropolitan Areas

SOURCE: Basic Data List of National Landuse Planning, Part II, p. 6.

3. Agriculture as Related to Rapid Economic Growth:

As a result of the "Agriculture Reform" immediately after the Second World War, the composition of Japanese agriculture producers changed drastically; agriculture shifted from the hands of landlords and their sharecroppers to ownerfarmers. This agrarian reform had various positive effects on Japanese modern agriculture. First of all, it strongly stimulated new ownerfarmers' will to work, and consequently the productivity of farming has been much improved. Second, this reform greatly contributed to the equalization of farmers' income and standard of living. Third, this reform encouraged the small farmer, even while (in a seeming paradox) it caused the birth of agricultural associations which have insulated farmers from the shocks of general economic fluctuations. Lastly, a longstanding barrier to the modernization of Japanese agriculture and the democratization of Japan was removed. Another important impact on agriculture was the rice price policy of the Japanese government, which, for political reasons, has purchased rice from farmers at a price which has risen annually, (because rice producers have long been a favorable voting constituency for the Liberal Democrats). This rice policy greatly contributed to the stabilization of farmers' income, especially that of rice producers, and this is well manifested in the rise of economic status of the Tohoku district which has long been the main rice-producing district in Japan. However, despite the continual absolute gains of agriculture, its relative position among all industries has steadily dwindled. Table II-6 shows the transition of workers by industrial classification. As shown, the decrease of workers in the primary industry is conspicuous, especially since 1960. In line with

this, agricultural income dropped from 18 percent of the total industrial income in 1955 to 9 percent in 1970. Another problem in agriculture is the decrease of arable farmland since the 1960's. The progress of urbanization throughout Japan has been attended by a remarkable decrease of arable land. From 1960 to 1974, 1.04 million hectares of arable land, which is 17 percent of the total farm land in Japan was diverted to use for residential and industrial purposes.

Summarizing the state of affairs in Japanese agriculture, the problems are how to:

- (1) raise a low productivity of labor (compared to a relatively high productivity per unit of farm land);
- (2) stem the exodus of the younger generation from farming industries, and so prevent what in Japan is called the "senescence" of agriculture; and
- (3) revitalize agriculture and provide for meeting the threatening future food crisis.

As shown in Table II-7, the productivity of labor in agriculture has shown great improvement. The annual improvement rate during the ten years from 1960 to 1970 attained 7.4 percent. Also, the net product per worker in 1970 was more than three and one half times that in 1960. However, spatial limitation of arable land, which has long been a limiting factor for large-scale farming, especially inhibits the advent of farm mechanization. Only in the Hokkaido district and on large-scale reclaimed farmlands in the Tohoku district does large-scale farm mechanization have a good chance.

Next, concerning the exodus of young farm workers, this will be a

crucial problem for both present and future farming in Japan. The ratio of young farm workers whose ages are between 16 and 29 dropped from 27 percent in 1960 to 8 percent in 1975, while the ratio of aged workers whose ages are over 60 went up from 14 percent to 24 percent. As shown in Table II-7, although the number of agricultural workers itself has decreased, it has not tied to the increase of farming unit; that is, those population switched their main source of income from agriculture to other occupations, but they still have farming job as a secondary income source. Hence, a small-scale farming does not attract the younger generation.

Further, concerning the security of food in the future, in order to attain self-sufficiency, Japan will have to secure 9.46 million hectares of new farmland. That is almost 1.7 times of the existing farmland of 6.07 million hectares as of 1974.

Looking at self-sufficiency with respect to food in Japan, edible agricultural products which have held constantly at a high self-sufficiency level are rice, which has been constantly produced to fill 100 percent of national demand; vegetables, 98-99 percent; eggs, 98-99 percent, pork, 87-88 percent. On the contrary, beans have filled only 10 percent of the demand, especially critical one is soybeans, it has filled only 1-2 percent; beef, 60 percent; sugar, 20 percent. Although the Japanese government worked out the conception of food base for future food crisis, judging from various points, the potentialities of the Tohoku and Hokkaido districts, which have been blessed by relatively large areas of cultivable flat land, will be exhibited in the near future. In fact, these two districts eagerly expect the Shinkansen to be a trigger for

Table II - 6
Transition of Workers by Industrial Classification

	Ratio by Industrial Classification		
	Total	Primary	Secondary Tertiary
1920	100	53.6	20.7 23.8
30	100	49.4	20.4 30.0
40	100	44.0	26.1 29.2
50	100	48.3	21.9 29.7
55	100	41.0	23.5 35.5
60	100	32.6	29.2 38.2
65	100	24.6	32.3 43.0
70	100	19.3	33.9 46.7

SOURCE: Basic Data List, p. 14.

Table II - 7
Major Indices of Japanese Agriculture

(fiscal year)		1960	1965	1970
Net Agricultural Product (¥100 million)		13,566	21,578	32,559
Ratio to Net Domestic Product (%)		10.2	8.3	5.5
Population Employed in Agriculture (10,000)		1,196	981	811
Ratio to Total Employment (%)		26.3	20.6	15.9
Net Product Per Worker (Nominal, ¥1,000)	Agriculture	113.4	220.0	400.9
	Manufacturing	405.8	625.5	1,277.5
Agriculture to manufacturing Productivity Ratio (%)		27.9	35.2	31.4
Labor Productivity Index	Agriculture	100.0	33.4	173.9
	Manufacturing	100.0	142.8	282.2
Per Capita Housekeeping Expenses (¥1,000)	Farm H.H.	60.6	115.3	236.8
	Worker's H.H.	80.0	139.7	248.6

SOURCE: Simons, Japan, p. 108.

drawing out this potentiality from both districts.

C. Stresses Generated by Vigorous Economic Growth:

As a consequence of the Vigorous Economic Growth between 1950 and the 1960's, various social problems have emerged. Those are (1) Overpopulation (including concentration of industries in a specific area); (2) depopulation; (3) regional differences; and (4) environmental disruption. These four problems can be significant political assignments for future regional development in Japan. As mentioned previously, from 1950 up until quite lately, the influx of industries and population has continued unceasingly. The gravitation of population to particular areas and the concentration of industries should not always be criticized. The point is that the improvement of social overhead capital is apt to fall behind social needs. Also, excessive loss of population in rural areas often impedes sound utilization of social overhead capital. For example, in order to maintain schools, hospitals, etc. in a sound condition, a certain population is needed. The status quo of these problems in Japan will be discussed here a little more precisely.

1. Overpopulation: As implied in the above examination, when the amount of capital going into private plant and equipment investment significantly outpaces the gross domestic fixed capital formation of government (that is, when population is attracted by expanding labor markets to areas which lack adequate public accommodations and services), the characteristic problems of overpopulation emerge. Figure II-2 provides clear information about the loss of this balance. Namely, with the year 1955 as a peak, the ratio of the gross domestic fixed capital formation of government to private plant and equipment investment has

fallen to 0.401 (See Table II-8). According to the estimate of the 2nd National Comprehensive Development Plan, this figure could be 0.74-0.75 by 1985. In this sense, a rapid fall of the ratio since 1965 exactly indicates the big delay of the improvement of social overhead capital. As a result, a number of problems due to overpopulation have emerged. Consider the case of Tokyo as an example.

The Housing Situation in Tokyo - Table II-9 provides a good glimpse of the status quo of housing problems in Tokyo. Although the total number of housing units in Tokyo had attained 2,967 million against 3,116 million households in 1968, many of these housing units are in extremely poor condition. For instance, the rate of households afflicted with such problems as inadequate space, multiple families under the same roof, etc. attains 26.6 percent (against the national average of 14.6 percent). This fact is further corroborated by other data; that is, the average floor area per housing unit in Tokyo, for instance, is only 50.2 m^2 (540 sq. ft.), compared to the national average of 73.9 m^2 (795 sq. ft.), although this figure, 73.9 m^2 , falls far short of the area deemed adequate for an average family. Also, 1.04 million units out of approximately 3 million units are wood-frame apartment houses, and 880,000 of those are in particularly poor condition; e.g., these apartments do not have private latrines and kitchens. Another 101,000 units are officially classified as dilapidated housing; 43,000 of these units built in the 1950's and managed by the Tokyo metropolitan prefecture, will have passed beyond their durability lifetimes by 1980.

Furthermore, the recent skyrocketing price of land has made it almost impossible for average people, even middle-income households, to

buy land for an independent house in Tokyo. As a result, the construction of high-rise apartment houses in and around Tokyo (with "efficient utilization of valuable land" as a catchword) has accelerated. According to a publication of the Tokyo metropolitan prefecture titled "Tokyo Metropolitan Prefecture, Middle-range Planning, 1974," during the five year period from 1968 to 1973, the number of housing units rose to 3.79 million compared to 3.67 million households. This increase (.7 million) greatly owes to the new construction of high-rise apartment units. However, it may safely be said that these high-rise apartment houses have further worsened the housing environment in Tokyo. The obstruction of sunlight and television reception have become serious issues between developers and local residents.

Water and Sewer - In 1970, the rate of the houses with public water supply in the Tokyo Metropolitan Area attained 91 percent. The average water consumption per day in Tokyo attained 4,164,000 m³ in 1970, which was almost double the figure in 1960 (2,320,000 m³). The Tokyo Government had dealt with the rapid increase of water consumption by utilizing available remote sources of water supply, and pumping up the ground water. Up until the end of the 1950's, the lack of water was a problem in the summer season; however, at the present time, the lack of water has become a problem at all times of the year. Further, a land subsidence in the northeastern part of Tokyo due to lowering of the water table had been very serious in recent years. Although the Tokyo Government has resorted to such measures as a strong restriction on the excessive utilization of ground water for industrial uses, the restriction

of water supply to households in case of necessity, and the invoking of restrictions to the most new proposed buildings from the viewpoints of water resource conservation, things are getting serious. A recent Japanese paper reported the Tokyo Government's plan for an underground water reservoir which is planned to be built in the gravelly northern part of Tokyo. The intent of this plan is to store rain water and riverbed water between underground layers of gravel; however, full realization is far from certain.

Concerning sewage treatment, a large part of sewage is never purified by treatment plants in Japan. Even in Tokyo, the rate of sewage treatment was just 55.7 percent as of 1975 (Minryoku, 1976). Further, almost a fifth of this 55.7 percent is accounted for by private septic tanks. These figures are not always high elsewhere within the Tokyo Metropolitan Area, either. For instance, Kanagawa's rate is 43.7 percent; Chiba, 28.9 percent; and Saitama, 27.0 percent. Chiba's and Saitama's figures are lower than the national average of 29.2 percent.

Traffic Problem - The night-time population of the City of Tokyo had decreased from 8.9 million in 1965 to 8.82 million in 1970. On the other hand, the daytime population increased from 10.06 to 10.44 million. The number of students and workers from the neighboring prefectures and suburbs of Tokyo metropolitan prefecture commuting per day to the central part of Tokyo had reached 770,000 persons in 1960; 1,340,000 in 1965; and 1,830,000 in 1970. As compared with these figures, the total carrying capacity of national and private railways was 470,000 passengers per hour at the maximum level. Accordingly, in a rush hour, the average congestion rate was, surprisingly 200 percent of a carrying capacity of

railways.

On the other hand, the total length of roads in Tokyo was 113,000 km by 1970. The ratio of roads to the total area of Tokyo had become 12.3 percent, which is equivalent to the ratio of roads in Paris. However, in comparison with the figures in New York, 35.0 percent, and London, 23.0 percent, Tokyo's ratio is still in a low level. Further, the fact that the area of roads in Tokyo had increased only 1 percent during the term 1963-1974, while the total investments in road during the same term was more than ¥1,000,000,000,000 is worth notice.

The number of automobiles reached 2.34 million in 1971, which was almost three times of the number in 1962. The area of road per automobile in Tokyo was 46.1 m^2 in 1971 in comparison with 177.2 m^2 in New York and 167.8 m^2 in London. These figures obviously indicate the necessity for drastic policy alternatives. Nevertheless, according to a quite recent Japanese newspaper, the Tokyo government confessed itself unable to arrange for the restriction of automobiles in central Tokyo. In other words, this means that the delay of social overhead capital has already gotten into a deadlock.

Land Price Problem - As repeatedly mentioned, the industries in pursuit of the profits of accumulation in urban areas has long been continued, and the unwillingness of the government to implement land price control has encouraged land speculation all over the nation by developers and realtors. The slackness of the money market since 1970 has especially spurred this tendency (See Figure II-4).

As mentioned before, it has been almost impossible to purchase land for private independent houses in the central part of Tokyo.

Reflecting this, the site of public housing in Tokyo has become more and more distant, (See Figure II-5). Also, the site acquisition and compensation cost for public works in Tokyo metropolitan prefectures by 1970 had attained 582.8 percent of the national average (See Table II-10). The tremendous difficulty of land acquisition in big cities has become a significant impediment to such improvements of the urban environment as urban renewal, the construction of special sites for the prevention of disasters, the security of parks and green spaces, the improvement of traffic facilities such as the enlargement of playground of the primary school.

2. Depopulation:

The movement of population from 1950 through the 1960's has induced the problems of overpopulation in urban areas, but depopulation in rural areas.

Among 3,276 local governments in Japan as of 1970, only 564 cities, towns, and villages (17.2 percent of the total) have flourished; 376 units (11.5 percent) have become static; and the rest, 2,336 units (71.3 percent) have been on the decline (Kamitsu-Kaso eno Chosen, 1975). Among these 2,336 cities, the number of the units which have suffered from more than two percent of annual decrease of population has attained 963 units. And the greater part of these two groups--stagnating and declining groups--are within rural areas, especially within the areas of Kyushu, Tohoku, Chugoku and Shikoku.

Almost all cities have suffered from tax revenues shortage, and the senescent trend of the resident composition. As a matter of fact, the problem of increasing numbers of the aged is especially intense for depopulated areas. The ratio of people aged 65 and over in the national

level is 7.1 percent and in urban areas is 5.1 percent; however, in the depopulated area, it attains more than 10 percent. Naturally, this phenomenon is attended by a corresponding decline in labor productivity as well as a (less well-defined) falling off of cultural activity.

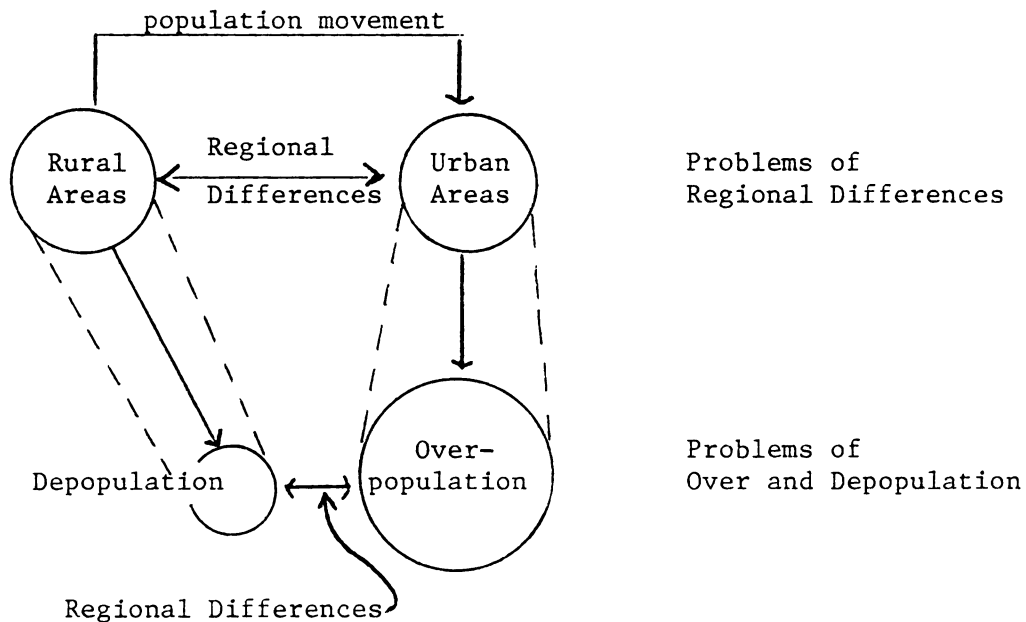
However, since 1970, this movement pattern has undergone some change. Rural communities around large-scale local core cities such as Sapporo, Sendai, Hiroshima, and Fukuoka have grown rapidly, as have local core cities, though these are often the capitals of each prefecture such as Morioka, Akita, Kumamoto, etc. (See Table II-11).

This change of movement pattern will have a somewhat desirable influence upon the depopulated areas; that is, the growth of these local core cities might represent a start in resolving the afore-mentioned problem of overpopulation and depopulation.

3. Economic, Social, and Cultural Regional Differences:

In the past, the problems of regional differences were claimed by the so-called "less-developed" prefectures. That is, the income of prefectural citizens, per capita income, the standard of worker's wages, the lag in providing industrial and educational structures, etc. were primary grievances by those prefectures. But in recent years, regional differences of the standard of living environment have come into question, and those claims have been made by the so-called "developed" prefectures--for example, developed prefectures are now citing unbalanced distributions of Dietman's allotment, and unbalanced taxation upon salaried workers. Incidentally, the correction of regional differences and the dissolution of over- and depopulation are theoretically in the relation of trade-off. It is presumed that, when the growth rate

is different in each area, an emphasis on correcting over- and depopulation problems will result in intensification of regional differences; and if emphasis is placed on the dissolution of regional differences, it is difficult to restrain population movement. This logic may be clearly understood by the following illustration.



Nevertheless, measures taken by governments in the 1960's, regardless whether by central or local government, were almost all taken from the viewpoints of the dissolution of regional differences. In other words, government per se has long taken the measures to encourage population movement with less understandings of the energy and behavior of urbanization, and the impact of industrialization and urbanization upon rural areas. In the future, a less simplistic and more accurate understanding of these socio-economic phenomena must be incorporated in programs whose end objective is the correction of regional differences. Let's look at

regional differences with respect to per capita income. Supposing the index for Tokyo in 1972 is 100, the index of the lowest per capita income prefecture, Kagoshima was 39.5 in 1972. In the Tohoku districts, Miyagi was 55.2; Fukushima, 49.3; Yamagata, 48.3; Iwate, 45.0; Aomori, 44.2 and Akita, 43.2 respectively. Also, Hokkaido had the same figure as Miyagi's 55.2. However, judging regional differences from different aspects such as the habitable area per person, the total area of park and green areas, water quality, average expectancy of life, number of houses owned, etc. the differences shift. Hokkaido is ranked first; Tokyo is ranked twelfth; Osaka, thirty-third; Aichi, thirty-fifth; Hyogo, forty-first; Kanagawa; forty-sixth, etc.

As mentioned above, well-balanced measures in terms of socio-economic aspects will be the key for future regional development.

4. Environmental Disruption:

First, let's look at the status quo of Tokyo's environmental disruption.

Airpollution - Sulphur oxide in the air has decreased since 1968-69; however, the regulation of nitrogen oxide is still ineffective. According to Masahiko Honjo, the air of Tokyo is polluted by the 800,000 tons of sulphur oxidant (in 1970, by combustion of crude oil along) and by the exhaust from four million automobiles. Also, photo-chemical smog phenomenon can be observed in many places. The number of days when the photo-chemical smog phenomenon has occurred have increased from 29 days per year in 1970 to 72 days in 1972.

Water Contamination - Again, according to Honjo, against the BOD of 644,000 tons poured into Tokyo Bay in 1969 alone, only some 50,000

tons of dissolved oxygen were supplied by natural purification. Also, according to the Tokyo government's report, but for two exceptions, all rivers exceed BOD 10 ppm and some rivers exceed BOD 55 ppm and produce offensive smells. 933 factories use heavy metals along these rivers, and the factories using cyanide and chromium number over 700. Consequently, the situation around rivers in Tokyo will be unpredictable.

Noise and Vibration Disturbance - During the term between 1961 and 1971, the number of reports complaining about noise and vibration increased from 1,624 to 15,843 per year. Along the main arteries, the residents have suffered from more than 70 to 80 phons almost all day. According to the Tokyo government's report, the ratio of claims concerning environmental disruptions in 1972 are that noise and vibration occupied first place--49.6 percent; offensive odor, 21.3 percent; air pollution, 19.1 percent; water contamination, 2.5 percent; and others, 6.5 percent.

Clearly, Tokyo's environmental condition is at an extremely poor level. Although the Tokyo government has published, apparently at a cost of much time and effort, a plan titled, "Program for Protecting Tokyo Citizens from Environmental Pollution," its efforts would be better directed in carefully considering how social overhead capital can be improved, since capital is the sine qua non of any ambitious social or environmental program. These problems are not limited to Tokyo and other big cities. Accompanying the dispersion of industries, and the progress of urbanization, the problem of environmental disruptions will be the tomorrow's problem in rural areas. In fact, the lack of social facilities will cause much worse disruption than that presently experienced in big cities. Numerous data have already shown

the appearance of environmental pollution in rural areas.

D. Summation:

During the period of 1953-75, the distribution of industrial output has diverted from both Tokyo and Osaka central areas to their peripheral areas and out further to Nagoya and its peripheral areas; however, basic resource type industry, especially 50 to 60 percent of the steel, oil refining, and petro-chemical industries, have concentrated in the Tokyo, Osaka, and Ise Bays where the City of Nagoya faces on, and 80 to 90 percent of these industries in the Pacific Coast Belt Industrial Zone. Since the end of the 1960's, such environmental disruptions as water contamination, air pollution, land subsidence, industrial waste, and the problem of water resources have constituted a severe restriction for the expansion of industrial production in the Tokyo Bay and the Seto Inland Sea Areas. Although industry in these two areas has developed by continuous reclamation of the foreshores, this growth has already exceeded its limits in terms of the relationships with overpopulation, environment, transportation, and fishery. However, in order to maintain the present economic scale, and to prepare for future stable growth, it has been said that there is still a need for new development of industrial sites, especially sites for basic resource-type industries. On the other hand, the antagonism of residents against large scale industrial development has been increasing. Also, judging from the increasing influence of environmental viewpoints, new development of large-scale coastal type process industries will be fairly difficult. Although it is discussed in detail in the fifth chapter, by the 2nd National Comprehensive Development Plan (1969), five large-scale industrial development projects

Table II - 8

Transition of Private Plant & Equipment Investment and Gross Domestic

Fixed Capital Formation of Government

(1965's price, ¥1 billion)

	GNP	Ip	Ig	Ig/Ip	Ig/GNP	Ip/GNP	GNP (%) Growth Rate
1951	9,823.9	853.8	511.9	0.600	0.052	0.087	
52	10,882.7	973.1	565.9	0.582	0.052	0.089	11.65
53							
54							
55	13,449.8	1,191.4	752.7	0.632	0.056	0.089	10.81
56							
57							
58							
59							
60	20,393.9	3,292.8	1,436.5	0.536	0.070	0.161	12.51
61							
62							
63							
64							
65	32,394.8	4,994.7	3,016.7	0.604	0.093	0.154	5.70
66							
67							
68							
69							
70	56,191.1	13,014.2	5,130.5	0.394	0.091	0.232	10.37
71							
72							
73	70,219.1	16,619.7	6,662.7	0.401	0.095	0.237	6.08
2ND Compre- hensive Develop- ment Plan (1985)	130,000 - 150,000	15,000 - 21,000	11,000 - 16,000	0.74 - 0.75	0.09 - 0.11	0.12 - 0.14	7.2 - 9.0



Table II - 9
Housing Conditions of Tokyo and Nation
in 1968

	Unit	Tokyo	Nation
No. of Household	1000	3,116	24,922
Rate of the Shortage of Decent Housing	%	26.6	14.6
No. of Housing Unit	1000	2,967	24,198
Owners	1000	1,216 (41.0)	14,594 (60.3)
Renters	1000	1,751 (59.0)	9,604 (39.7)
Independent Housing	1000	1,324 (44.6)	16,102 (66.5)
Apartment House (Wooden)	1000	1,038 (35.0)	13, 147 (13.0)
(except Wooden)	1000	306 (10.3)	1,302 (5.4)
Apartment House--Poor Conditioned	1000	880 (29.7)	2,719 (11.2)
Total Floor Area per Unit	m ²	50.21	73.86

SOURCE: Basic Data List, p. 55.

Table II - 10
 Compative Data of Land Acquisition and Compensation
 Cost per Square Meter of Public Undertaking
 as of 1970

	Land Acquisition & Compensation Cost (¥1,000)	Acquired Area (m ²)	Cost per Square Meter (¥/m ²)	Comparative Rate
Tokyo	64,117,709	2,162,133	29,655	582.8
Kanagawa	21,805,210	1,776,068	12,277	241.3
Osaka	65,810,390	2,151,277	30,591	601.2
Hokkaido	22,357,039	17,270,344	1.295	25.4
Iwate	3,951,058	3,744,763	1,055	20.7
Kagoshima	3,173,452	2,301,838	1,379	27.1
Whole Nation	650,498,000	127,840,942	5.088	100.0

SOURCE: Basic Data List, p. 66.

Table II - 11
 Transition of the Ratio of Population in the Capital Cities for
 Each Prefecture's Population (%)

	Tohoku District					Kyushu District			
	1960	1965	1970	1975		1960	1965	1970	1975
Aomori	14.2	15.8	16.8	18.0	Fukuoka	17.0	19.4	21.6	23.3
Morioka	10.9	12.5	14.3	15.6	Saga	13.8	15.4	17.1	18.2
Sendai	24.4	27.4	30.0	31.5	Nagasaki	22.0	25.0	27.1	28.6
Akita	15.2	16.9	19.0	21.2	Kumamoto	20.1	23.5	26.4	28.5
Yamagata	14.3	15.3	16.6	18.0	Oita	16.7	19.1	22.5	26.9
Fukushima	6.8	8.8	11.7	12.5	Miyazaki	14.7	16.4	19.3	21.6
					Kagoshima	17.0	20.0	23.3	26.5

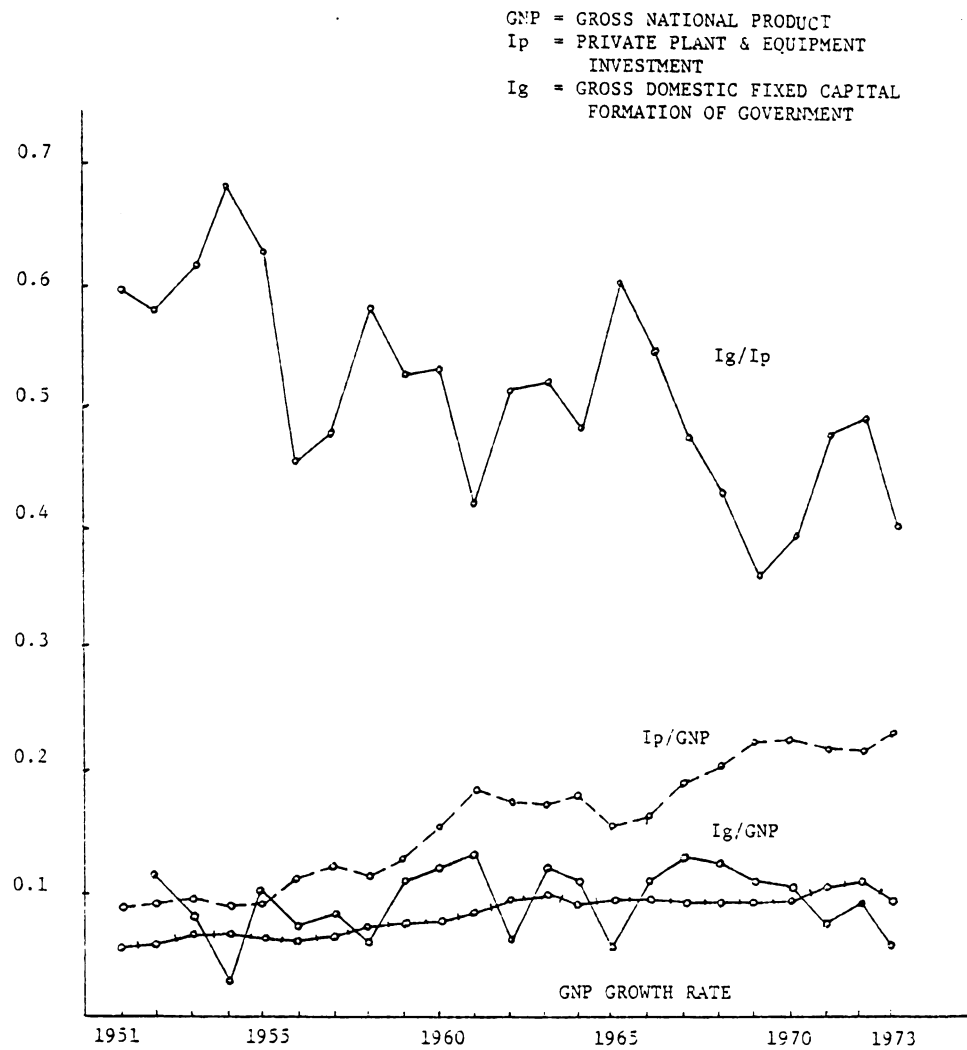


Figure II-3 - Transition of the Ratios between the Gross Domestic Fixed Capital Formation of Government and Private Plant and Equipment Investment and others.

SOURCE: Basic Data List, p. 17

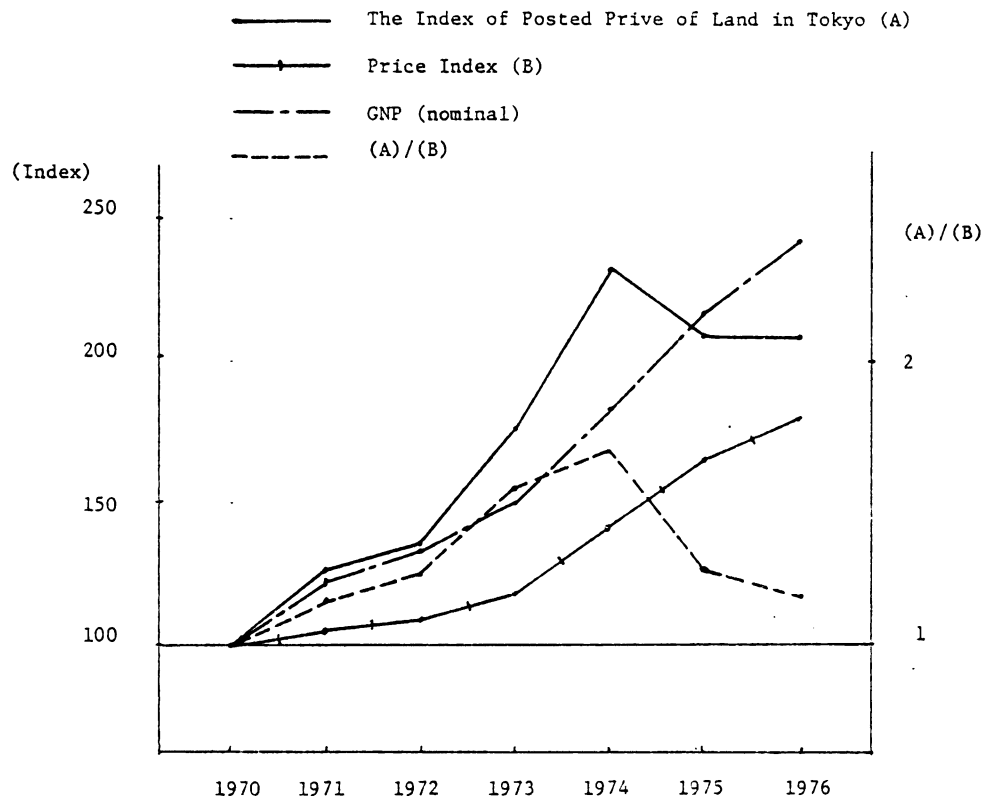


Figure II-4 - The Transition of Land Price, Commodity Price, and GNP in Tokyo

SOURCE: White Paper for National Land Utilization, 1976, p. 94.



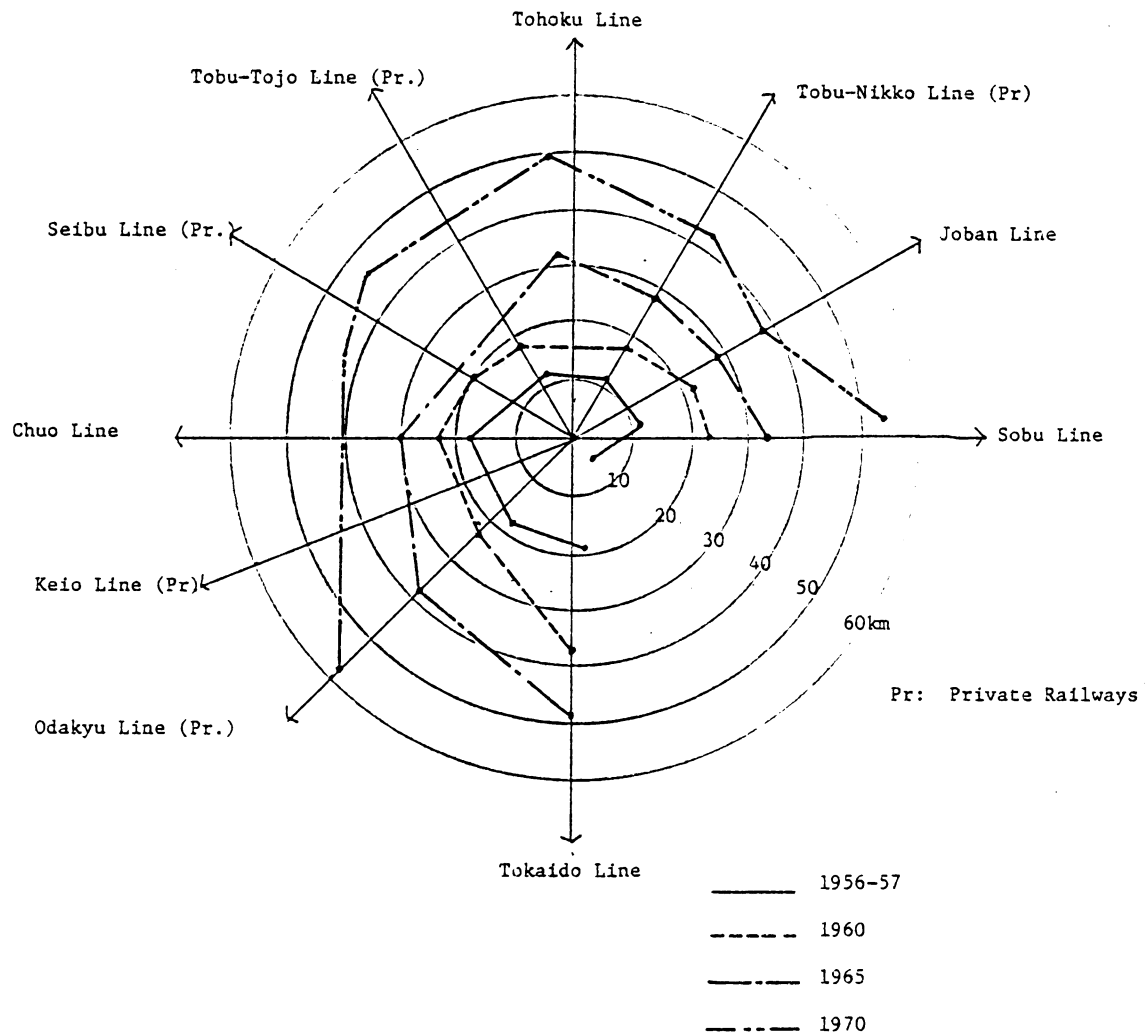
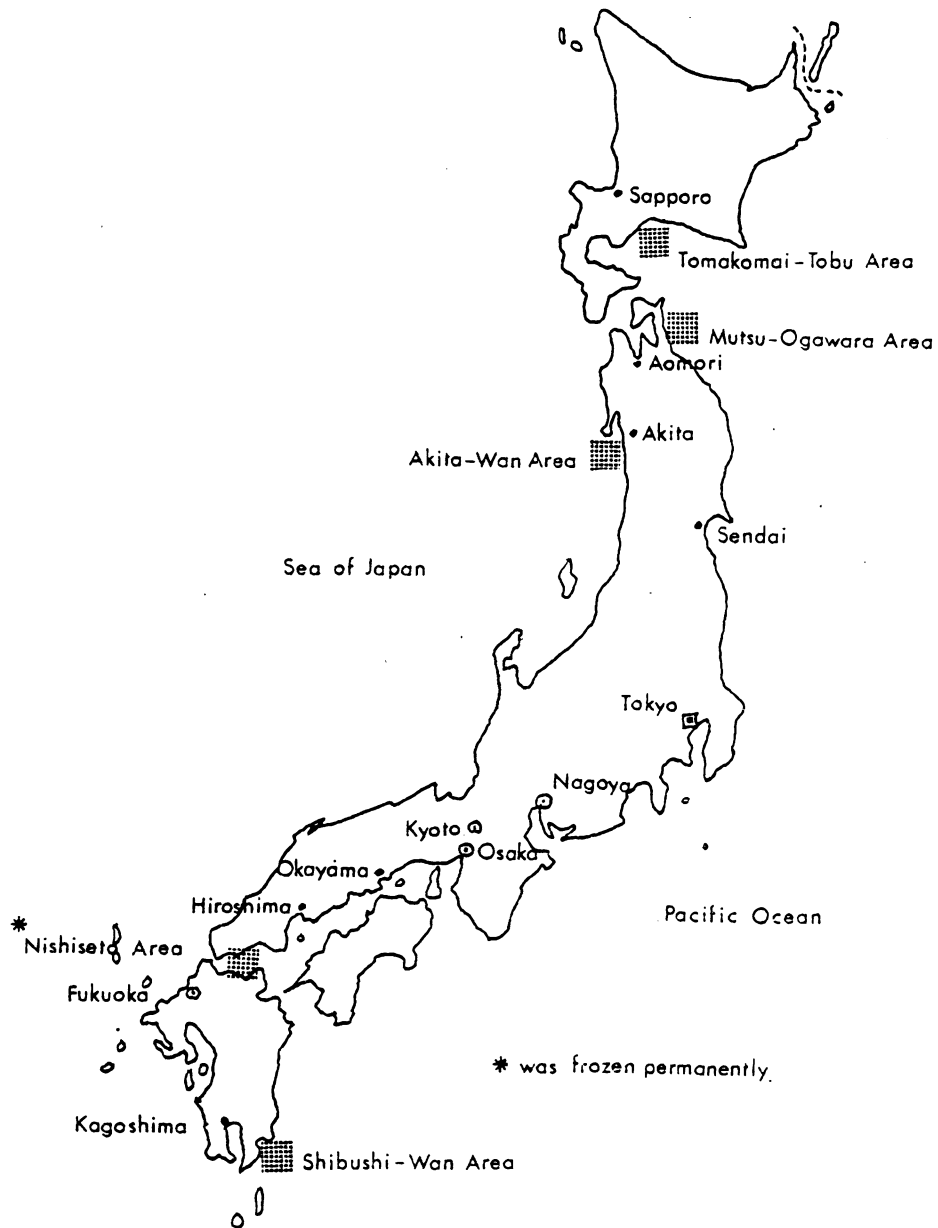


Figure II-5 - Locations of Public Housing in Tokyo by Year and Relations to Commuter lines





Map II-1: 5 Large-scale Industrial Development Areas

were authorized (See Map II-1); however, at the present time, one project was frozen permanently, and the other four have to be either reduced or in watchful waiting (The Asahi, 11 June 1977). Accompanying this tendency, it has become very popular to take a new look at inland-type industry.

It goes without saying that the Tohoku district avidly anticipates the development of this inland-type industry with the development of the Shinkansen and the Tohoku Interprefectural Highways which run through inland areas of the Tohoku district as a momentum.

The potential impacts of the Shinkansen system and the evaluation of the Tohoku Shinkansen and the reactions of local people are discussed in the third and fourth chapters respectively; however, the transition of the conception for the types of industry might be the catalyst for the Tohoku, and also, for the Hokkaido districts in terms of socio-economic development.

III. EVALUATION OF THE POTENTIAL IMPACTS OF THE NEW TRUNK EXPRESS RAILWAY SYSTEM

In the preceding Chapter (II), the overall history of the formation of the regional socio-economic society in Japan was introduced. In this Chapter (III), an extremely strong relationship between the Japanese government's policies and the development of railway systems is discussed. In fact, it is not farfetched to say that the policies of the government in the past and even at the present cannot be analyzed without examining the history of the development of the railway system. Accordingly, a brief explanation concerning the growth of high-speed rail transport in Japan is discussed in Section (A), and various aspects related to the construction of the most sophisticated rail transit system, the Shinkansen, is discussed in Section (B).

A. The Growth of High-Speed Rail Transport in Japan:

An historically insistent problem for Japan, with its long, narrow geographical configuration, has been the difficulty of communication between northernmost and southernmost extremities; and in an age which did not have the advantage of many sophisticated communication measures, railway transport represented the best answer to this problem. In this regard, the progressive policy of the Meiji Government, which introduced the technology of western railway transport systems should be highly evaluated. The innovation was made with remarkable quickness; in 1872, only four years after the Meiji Restoration, the first railway service was inaugurated. Since then, especially since the turn of the century, proportionately with the continually increasing importance of railway transport system in terms of its economic, political, and strategic functions, the improvement of the railway network has steadily been a

high priority in Japan. In response to diverse national needs, the Japanese National Railways (JNR) has long endeavored to improve its transport functions. The JNR has innovated its technologies in anticipation of requirements from governments of the times. Various sophisticated technologies such as those involved in bridging, excavation of tunnels, chassis, the adoption of long-sized rails, and the improvement of motors have made possible the extension of the railway network all over the Nation, the birth of the New Trunk Express Railway Service.

Consider, as an indication of JNR's success, the single example of diminishing travel times between Tokyo and Osaka (which are approximately 400 miles apart):

Time Required between Tokyo and Osaka

	<u>HOURS</u>	<u>MINUTES</u>	
1929	10	52	
1930	8	20	
1934	8	00	] The Second World War
1949	9	00	
1950	8	00	
1958	6	50	
1959	6	00	
1964	4	00	] The Tokaido Shinkansen
1965	3	10	

Moreover, the quantitative and qualitative improvement of transportation facilities not only actualizes potential demand, but stimulates with added benefits, secondary growth of new industries and population within the beneficiary zones. It is said that Hokkaido's population growth from 90,000 in 1871 to 5 million at the present time is owing almost exclusively to JNR's endeavors. Also, the present prosperity

of the "Tokaido Megalopolis" is heavily indebted to the development of the Shinkansen system. In fact, it is not farfetched to say that Japan's cities have developed with the development of JNR; certainly railway transport has had important positive and negative impacts upon the metamorphosis of the Japanese archipelago, which have not failed to excite debate.

All capital investment, whether private or public, can be initiated for the fulfillment of important social purposes, or can give rise to unforeseen social purposes. The Shinkansen may be classified in the latter category. The economic benefits expected by the JNR from its investment in the development of railways have been carefully measured and justified; however, as far as the social benefits are concerned, these have been rather optimistically projected by the government of each era, because the railways have long been a key device for implementing administrative policies of the Central Government. Even at the present time, the building of new stations and induction of new railways always produce important repercussions for government representatives from the local areas affected. Of late years, however, the social influence and proper roles of the railway have become objects of intense interest and loud discussion, especially after the establishment of the Tokaido Shinkansen.

B. Various Aspects Contingent to the Construction of the Shinkansen:

Before entering into detailed discussion with respect to various positive and negative aspects of the Shinkansen in this and following sections, it will be necessary to touch briefly on the meaning of the Shinkansen system.

Inadequate transport capacity was the chief cause of the establishment of the Tokaido and Sanyo Shinkansens. According to interview statements of JNR's planners, the Tohoku and Joetsu Shinkansens are being constructed to fulfill the same objectives as the cases of the Tokaido and Sanyo Shinkansens; the increase of transport capacity is in all cases the first priority.

However, the great success of the Tokaido and Sanyo Shinkansen has induced many authorities--politicians, economists, socialists, etc.--to assign it a uniquely meaningful place. Not surprisingly, some exaggeration has resulted. For example, the former Prime Minister of Japan, Kakuei Tanaka, utilized the Shinkansen as a definite trump for realizing his conception of "remodeling the Japanese archipelago." Many others stress the value of the Shinkansen in dissolving regional differences--economic, social, and cultural.

However, since the oil embargo of 1973, under new severe economic circumstances, the concept for the Shinkansen has meaningfully changed. The reconception of the Shinkansen has involved a number of background concessions, as, for instance, that it is no longer possible for the GNP to enjoy the rapid growth it has known in the past; that it is not necessary or even desirable to urbanize the whole nation, since external diseconomies have increasingly worsened around urban areas; that serious environmental disruption can be expected to occur along railway routes, and in and around cities which are terminal receiving stations for the Shinkansens; and that a rigorous feasibility study must be undertaken to avoid uneconomic investment in view of the imminent low-growth age.

The original plan of the Shinkansen network, contrasted with its revised or assumed plan which will be realized in or after 1985, makes clear the impact of the Japanese economy upon such large-scale projects (See Map III-1 and III-2).

1. Various Positive Aspects of the Shinkansen:

JNR's Shinkansen had already carried more than 800 million passengers, which is more than six times of Japan's total population, by 1974, after only ten years of service. During this term, not one accident resulting in injury or death has been experienced by the Shinkansen.

Throughout thirteen years of the experimentation of JNR's Shinkansen, many studies have been done concerning its effects. Many things are still unclear. The positive impacts of the Shinkansen may be arranged, in order of diminishing importance, as follows:

- (1) Primary effects such as the retrenchment of time-distance of the augmentation of transportation capacity, and derived impact from the accompanying investment with the construction;
- (2) Secondary effects such as the conservation of labor force and energy, and the increase of the tourist trade;
- (3) Tertiary effects such as the enhancement of social and cultural motivation, and the enlargement of market spheres.

As will be very apparent, the primary and the secondary effects are relatively easy to recognize; however, the tertiary effects are a controversial issue. The tertiary effects are bound to receive widely different interpretations.

The Primary Effects - At one time, even until comparatively lately,

600 kilometers travel required considerable time and effort. The Shinkansen made this travel quite easily, so that even a 1,000 kilometers distance, the length of the Tokaido and Sanyo Shinkansen route, was taken the one-day travel range.

Extrapolating the effect of the retrenchment of time-distance the shape of Japanese archipelago will be as shown in Figure III-0 by the time that the Shinkansen has expanded to cover 3,500 km and 7,000 km respectively.

Hence, most of the Japanese archipelago will be included in the one-day travel sphere. This effect must strongly spur the motivation of travel. The amount of time saved will be staggering.

Next, concerning the augmentation of transportation capacity the following table furnishes some indication of the great strides of yearly patronage of the Shinkansen since 1964.

<u>Year</u>	<u>No. of Patronage (million passengers)</u>
1964	11
65	31
66	44
67	55
68	66
69	72
70	85
71	85
72	110 (the extension to Okayama)
73	128
74	133

Not surprisingly, almost all patrons (over 800 million since 1964) have been businessmen and general travelers as well as tourists. None of these passengers are commuters. Further, this Shinkansen has never carried a pound of freight in its history; that is, it has been solely

for passengers. These peculiar facts well indicate the specific nature of this high-speed rail transit; that is, the Shinkansen appears to be well adapted to stimulate the large movement of population by its swiftness, mass carrying capacity, and remarkable safety record.

Also, according to the report titled "The Extension of the Shinkansen into Kyushu District and Kyushu Economy" made by the Kyushu Board of Economic Survey since the extension of the Sanyo Shinkansen into Fukuoka City; the number of passengers between Kyushu and Honshu islands increased more than 30 percent yearly. Judging from these data, it can safely be said that the Shinkansen has played an important role in effectively increasing geographical mobility. Furthermore, accessibility of the Shinkansen is great, and is steadily enlarging: 50 percent of the total population is able to use the Shinkansen at the present time; 80 percent will be able to use it once it has grown to a service distance of 3,500 kilometers; and 90 percent will be able to use it when 7,000 kilometers are completed. Accordingly, passenger demand and use of the Shinkansen will grow proportionately with its further expansion, at least to an extent. One possible effect of such extension is the revitalization of the old trunk railway network. For instance, the conversion of the existing trunk railways to exclusive freight-liner's line would be one possibility.

Lastly, turning to the derived impact from the investment accompanying the construction of the Shinkansen, this effect is of considerable significance for the areas concerned. For example, the increase of JNR's funds pouring into six prefectures in the Tohoku district since the start of construction of the Tohoku Shinkansen is nothing short of

remarkable. The total amount of funds in 1972 was only ¥40.3 billion; however, it increased to ¥188.0 billion in 1975. Also, the number of workers required for the construction will peak at over 10,000 per day. Further, the maintenance of railway and new established stations and related facilities will require a fairly large number of employees. The scale of the influence on regional economy through these opportunities will not be so great; however, these will still be one of key effects of the Shinkansen.

The Secondary Effects - Secondary effects accompany the effects of the retrenchment of time distance and the conservation of labor force and energy. According to Yoshiro Nakai of JNR, who considered the retrenchment of traveling time in terms of manpowers saved, supposing that the Shinkansen takes over all of the old trunk lines through the nation in 1982, the total savable hours will be 0.5 billion a year, or 80 million man years, equivalent to approximate 300,000 laborers. Further, the retrenchment of traveling time was considered in economic terms by Unyu Chosakyoku (The Foundation of the Bureau of Transport Investigation), and estimated as follows:

1967	¥52.6 billion	$(121,473 \times 10^3 \text{ H} \times 483\text{¥/H})$
1970	¥121.4 billion	$(181,000 \times 10^3 \text{ H} \times 660\text{¥/H})$
1975	¥245.2 billion	$(230,000 \times 10^3 \text{ H} \times 1.055\text{¥/H})$
1980	¥483.7 billion	$(230,000 \times 10^3 \text{ H} \times 2.103\text{¥/H})$

Even though these figures can't be accepted recklessly, the effects of the Shinkansen cannot fail to be good as far as the conservation of labor and money is concerned. Of course, the effects of over- and depopulation,

and environmental disruption accompanying the development of the Shinkansen are not included in the above calculations at all.

Next, turning to the issue of energy conservation, the role that the Shinkansen has played is significant. At the present time, transportation fields are using approximately 13 percent of the total energy in Japan. And 10 percent of the above 13 percent is being used by railway's consumption. Converting this figure into calories needed for each kilometer traveled, an airplane requires 780 kilocalories; an automobile, 700 kilocalories; a bus, 120 kilocalories; an ordinal-type train, 80 kilocalories; and the Shinkansen, 100 kilocalories. Hence, clearly, the Shinkansen cannot be faulted in terms of energy conservation when compared with most alternative modes of travel.

Lastly, the increase of tourist demands is worthy of mention. For example, the extension of the Shinkansen to Okayama generated a tremendous boom of tourism. The number of tourists flowing into Okayama and peripheral areas increased 60 to 80 percent. However, the extension of the Sanyo Shinkansen into Fukuoka has not resulted in a good influence on tourist resorts, contrary to expectation. This, perhaps, is heavily due to the recent recession. However, in the long run, it can safely be said that the tourist demands will be developed by the Shinkansen. The expectation of further development in tourism is extremely strong in the Tohoku and Hokkaido districts. As for local governments in the Tohoku and Hokkaido districts, which are getting revenue only from agricultural products, although there are seasonal fluctuations, a cash income from tourism is surely desired.

The Tertiary Effects - It is fairly difficult to define these effects;

they are subject to variable interpretation. The social and cultural effects of the Shinkansen is stressed in a number of local governments petitions. But a clear demonstration of this effect has not yet been made. The developments of television, and the direct-distance dialing system have dissolved informational delay between urban and rural areas. As of 1975, the diffusive rate of color television was 90.3 percent, and that of telephones was 80.8 percent. Hence, the potential of television and telephone as communication media will be much larger than that of the Shinkansen.

Again, there may be an expectation among social and cultural experts that the Shinkansen will spur urbanization; however, the definition of urbanization is ambiguous. It is therefore difficult to prove the social and cultural effects of the Shinkansen at this time. No reliable assessment can be made until a reasonable time has passed.

Next, turning to the economic effect of the Shinkansen, a fair number of people have clearly defined this effect. For example, Zenichiro Ito, Professor at Tokyo Women's University, says that, after the completion of the Shinkansen network across the nation, the potential of the present Tokyo will tend north to the Tohoku and Hokkaido districts, and simultaneously the potential of the Keihanshin districts (Kyoto, Osaka, and Kobe) will tend west to the Sanyo and Kyushu districts. As if backing up this theory, the movement to the northern and southern parts of Japan of large-scale and fundamental resource-oriented industry--pulp and paper, chemicals, petroleum, steel and iron, nonferrous metals, etc.--has been conspicuous. Of course, this may be primarily due to the Japanese government's industry redistribution policy; however, it is not

unlikely, either, that future extension of the Shinkansen has become one of the key devices for deciding the plant location of those industries.

Kozo Amano of Kyoto University published a study ("A Regional Economic Impact of the Tokaido Shinkansen") concerning the economic effect of the Shinkansen, making use of his dynamic regional industry correlated model--the so-called "Amano Model"; and according to this analysis, the impact of the Tokaido Shinkansen was extremely strong for the Kinki and Tokai blocks (See Figure III-1). As shown in the Figure, for example, the industrial production of the Tokai block increased from ¥150.3 billion in 1966 to ¥432.1 billion in 1970. Similarly, the Kinki block's production increased from ¥123.1 billion in 1966 to ¥243.9 billion in 1970. Conversely, the Tohoku block's production decreased yearly; that is, as of 1966, the Tohoku block experienced a reverse effect from the Tokaido Shinkansen, and this negative impact increased yearly. The number of employees in each block has behaved in like fashion. The gravitation of industrial employees to the Kinki and Tokai block is notable. Conversely, there is a noticeable decrease of employees in the Tohoku block. Hence, the impact of the Tokaido Shinkansen was extremely strong in the Central Pacific Coast. This concentration of population and industries has also produced various negative dis-economies and environmental disruption in and around these areas.

Will the extension of the Shinkansen to the Tohoku, Hokkaido, and Hokuriku regions act to reduce the evils of concentration in and around the Tokaido Megalopolis? Amano also published projected impacts of the nationwide extension of the Shinkansen. Amano assumed four cases as premises of his analysis (See Map III-3 & III-4). Details of

each case are as follows:

Case 1: The total extension of the Shinkansen as of 1985 will be 1,540 km, not including the Tokaido Shinkansen, and the total extension of highways as of 1985 will be 2,509 km, not including the existing Tomei and Meishin highways (Tokyo-Kobe). Total construction cost will be ¥3,460 billion.

Case 2: The total extension of the Shinkansen as of 1985 will be 3,800 km, and that of highways, 2,509 km. Total cost will be ¥5,940 billion.

Case 3: The total extension of the Shinkansen as of 1985 will be 1,540 km, and that of highways, 5,974 km. Total cost will be ¥5,880 billion.

Case 4: The total extension of the Shinkansen as of 1985 will be 3,800 km, and that of highways 5,974 km. Total construction cost will be ¥8,360 billion.

Amano's conclusions are as follows:

- (1) The efficiency of transportation investment for national economy is in the following order: Case 4, Case 2, Case 3, and Case 1.
- (2) The cost-benefit ratio in each case exceeds one. Namely, somewhat benefits can be expected from each case. The efficiency of each case is in the following order: Case 2, Case 1, Case 4, and Case 3.
- (3) Looking at each case from the viewpoint of overpopulation and depopulation, Case 3, will spur the concentration most strongly and Case 1 will also spur the concentration. On the other

hand, Case 2 and 4 will spur the diffusion of economic activities; consequently the diffusion of population can be expected.

As mentioned in the previous chapter, the construction of the Shinkansen has been delayed, and Case 2 can most realistically be expected for 1985. An appreciable diffusion of industries and population may therefore be expected.

It is clear that the extension of the Shinkansen will have an important impact upon national and regional economies. The critical question is whether or not the authorities can successfully cope with the unavoidable negative impacts.

2. Various Negative Aspects of the Shinkansen:

Recently, the pros and cons against the extension of the Shinkansen have become strident. Since the 1973 oil embargo, the Japanese economy has been under a dark cloud, and a pessimistic view with respect to economic growth in the future is likely to lead public opinion. In addition, the enlargement of external diseconomy due to overpopulation and derivative environmental disruption from overpopulation have caused strong opposition to the extension of the Shinkansen, because it will just spur further concentration of population and industries in the existing major industrial zones. The growth of GNP assumed by the "Amano Model"--cumulatively, between 1975 and 1980, 10.7 percent--can not be expected now. The greater part of the criticisms against the construction of the Shinkansen say that the national Shinkansen network plan is a holdover from the era of high economic growth. Also, many point out the inefficiency of investment for the Shinkansen within the depopulated

areas. These negative opinions toward the extension of the Shinkansen are becoming main stream within the public.

Another very different objection concerns the noise and vibration of the Shinkansen. Although Japanese government settled the standard for noise and vibration levels for auto and railway traffic, the movement against the construction of the Shinkansen has been extremely severe among residents within the overpopulated areas. In fact, JNR was forced to pay \$600 million to the residents along the Tokaido and Sanyo Shinkansens as compensation for noise and vibration. Besides these problems, the Shinkansen adversely affects television reception by its noise and vibration, and its sound proof wall along railways block sunshine.

Next, the increase of local expenditures which will accompany construction of the Shinkansen and related facilities must be mentioned. For example, expenses for the construction of commercial facilities such as hotels, shopping centers, and transportation facilities such as the improvements of an access to the station, etc. will have to be borne by local finances and local governments. Also, expenditures for replanning of streets and subdivisions, and also necessary land reforms will be crucial for local finances. Many local governments have in fact suffered from the exhaustion of revenue sources for these projects. Further, among the secondary impacts is a sharp rise of land value around the station and commercial and business districts which is often apt to impede the inroads of exterior appropriate capitals, and the improvement of those afore-mentioned facilities by local often comes to nothing.

Thirdly, the conflicts between local and central capitals have to be carefully adjusted. The disappearance of local capitals due to the inroads of central capitals means the exodus of pivotal administrative function from local areas, and it is apt to be directly tied to further centralization of commercial functions. This is nothing else than the enlargement of regional differences.

Lastly, the most controversial effect, the so-called "counterflow effect," has to be considered. The status subsidence of Osaka and Nagoya, especially the subsidence of administrative function of these two big cities is a much-discussed current topic. This will be a typical case that the retrenchment of time distance to Tokyo has spurred the movement of administrative functions toward Tokyo. In fact, the number and percentage of pivotal administrators in Tokyo, especially firm executives and managing staffs have been increasing continually (See Table III-1). On the other hand, as noted previously, marked gravitation of population and administrative functions from peripheral areas to local core cities has been conspicuous in these years. Such cities as Sapporo, Sendai, Hiroshima, and Fukuoka will be picked out as typical cities which have experienced strong gravitation of the aforementioned functions. Especially, since the Sanyo Shinkansen was completed, the growth of two cities such as Hiroshima and Fukuoka is dazzling our eyes. However, on the other hand, the fact that pivotal administrative functions are being siphoned over by more strong cities, such as Tokyo, cannot be denied. Sapporo and Sendai may have the same experience. In general, local core cities are receiving derived effects from the Shinkansen such as, as mentioned above, the accumulation

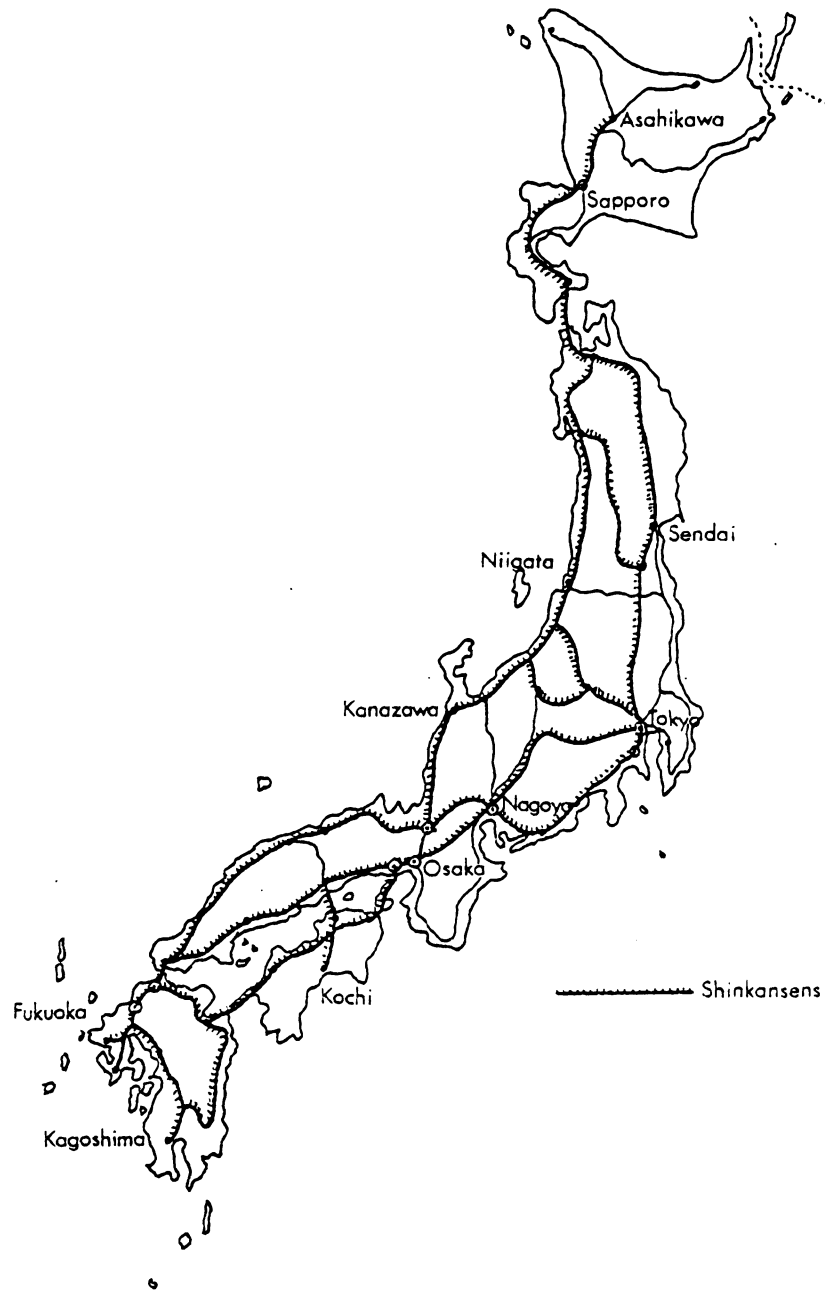
of administrative function from peripheral areas on the one hand, and simultaneously counterflow effects on the other.

C. Summation:

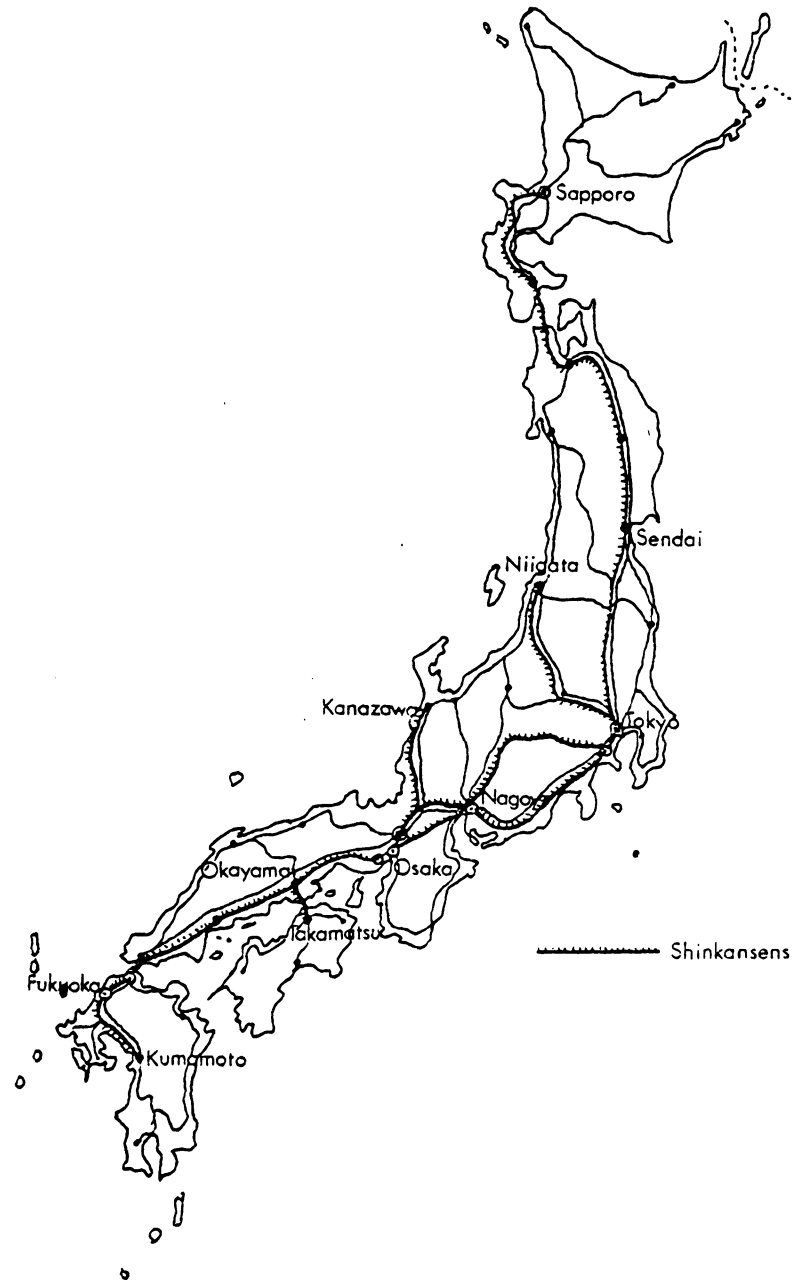
As has been mentioned, a speed-up of railway transport has been a crucial activity in JNR's long history. The establishment of new routes and new stations has spurred the movement of population and industries. Government has been using JNR as a key device for implementing local administration. However, transportation facilities per se are dynamic; they give rise to new demands, and greatly affect the structure of regional economy. In this sense, the gravitation of population and industries toward the Pacific Coast Belt Industrial Zone could have been natural results of the Tokaido Shinkansen, and a rapid development of Fukuoka and Hiroshima can be understood only through the extension of the Sanyo Shinkansen into Fukuoka City. The developments of Sapporo and Sendai will be understood if their development is seen as the result of anticipation of the coming Tohoku and Hokkaido Shinkansens. As a whole, the extension of the Shinkansen has not been a catalyst for resolving regional differences between the existing developed areas and relatively underdeveloped areas like the Tohoku and Hokkaido regions. What kind of alternative measures should be done in order to resolve the so-called regional differences? Somewhat drastic measures, such as preventing the Tohoku Shinkansen from extending into the central part of Tokyo, might be considered.

In the following chapters, ardent hopes and expectations of the locals with respect to the Tohoku and Hokkaido Shinkansens will be described, and the measures for maximizing the impact of the Shinkansen upon

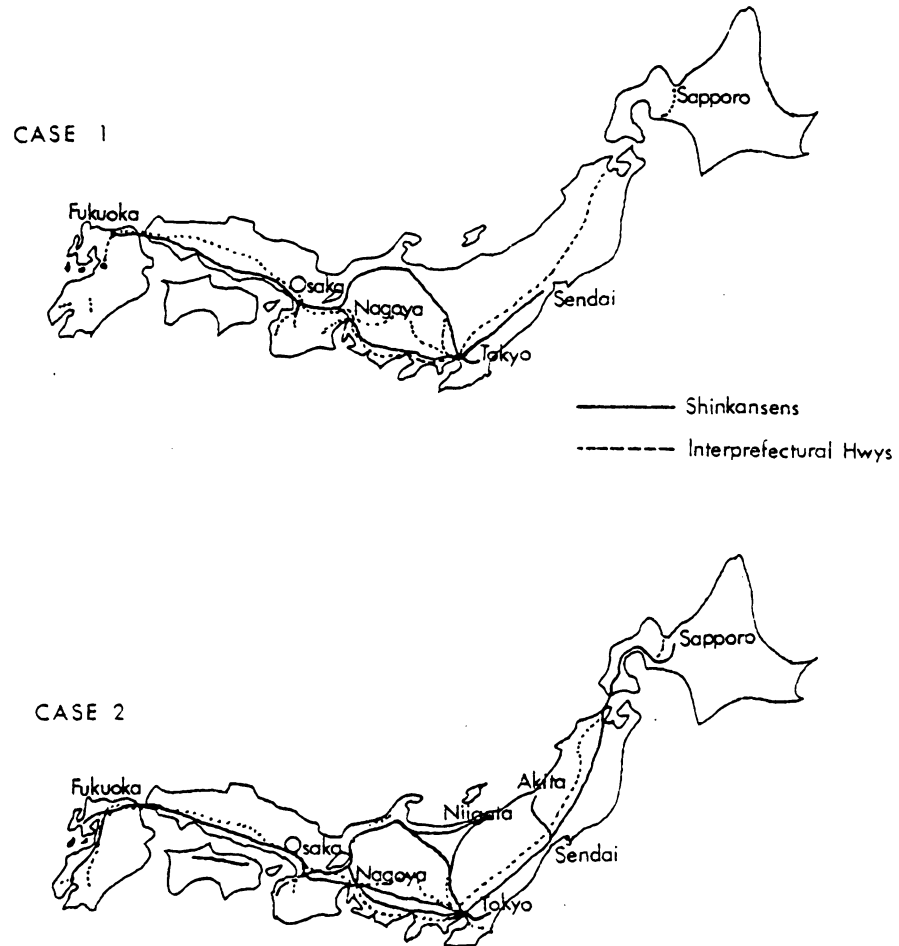
socio-economic development of the Tohoku and Hokkaido districts will be discussed.



Map III-1: Shinkansen Network in the 2nd National Comprehensive Planning - 7200 km

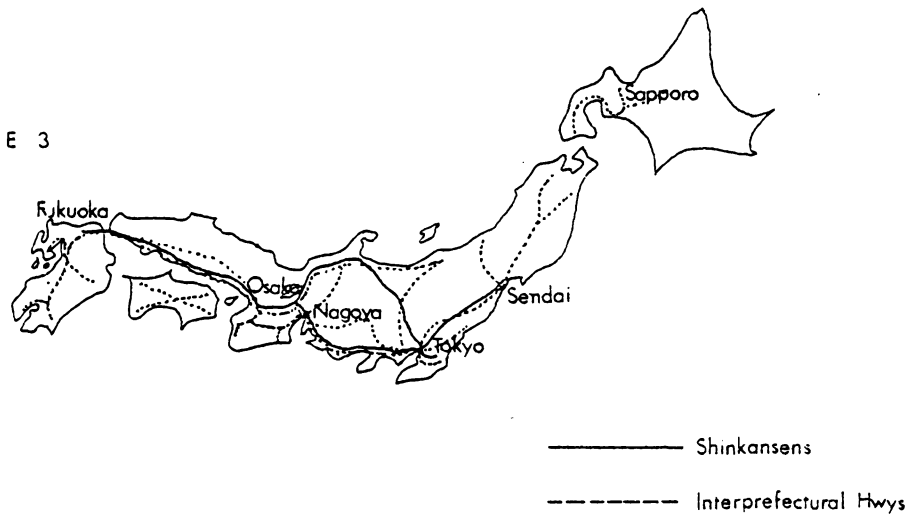


Map III-2: Shinkansen Network based on the realities - 3500km

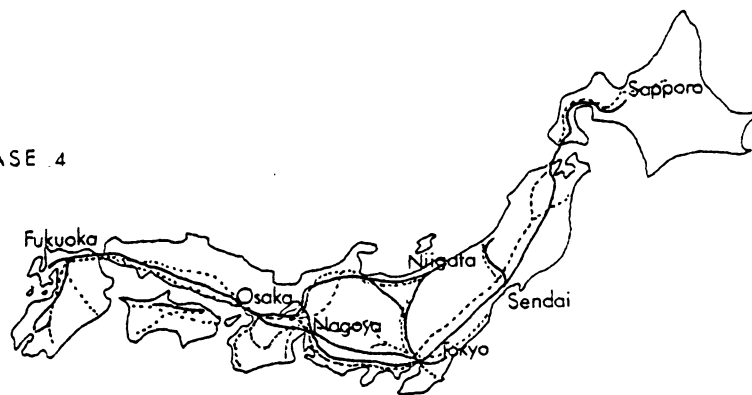


Map III-3: AMANO Model - CASE 1 & 2

CASE 3



CASE 4



Map III - 4: AMANO Model - CASE 3 & 4

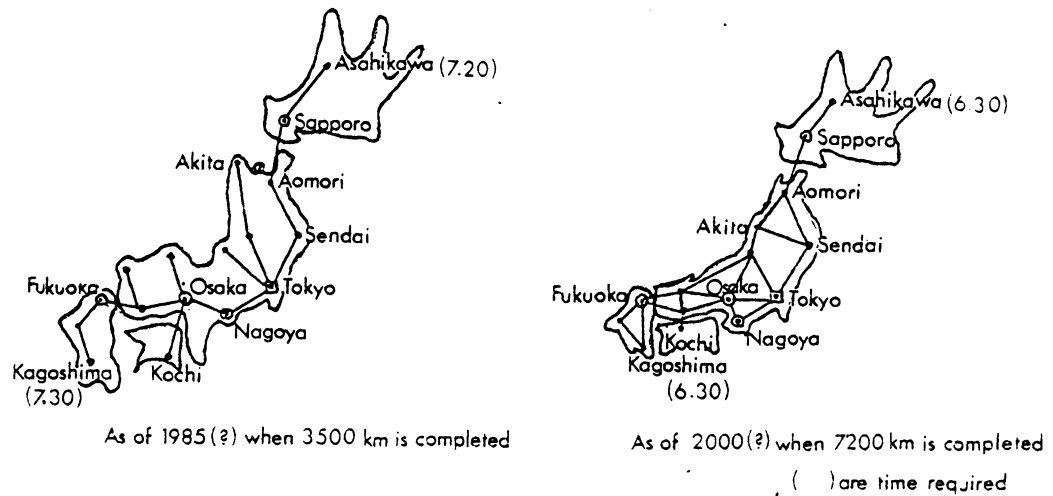
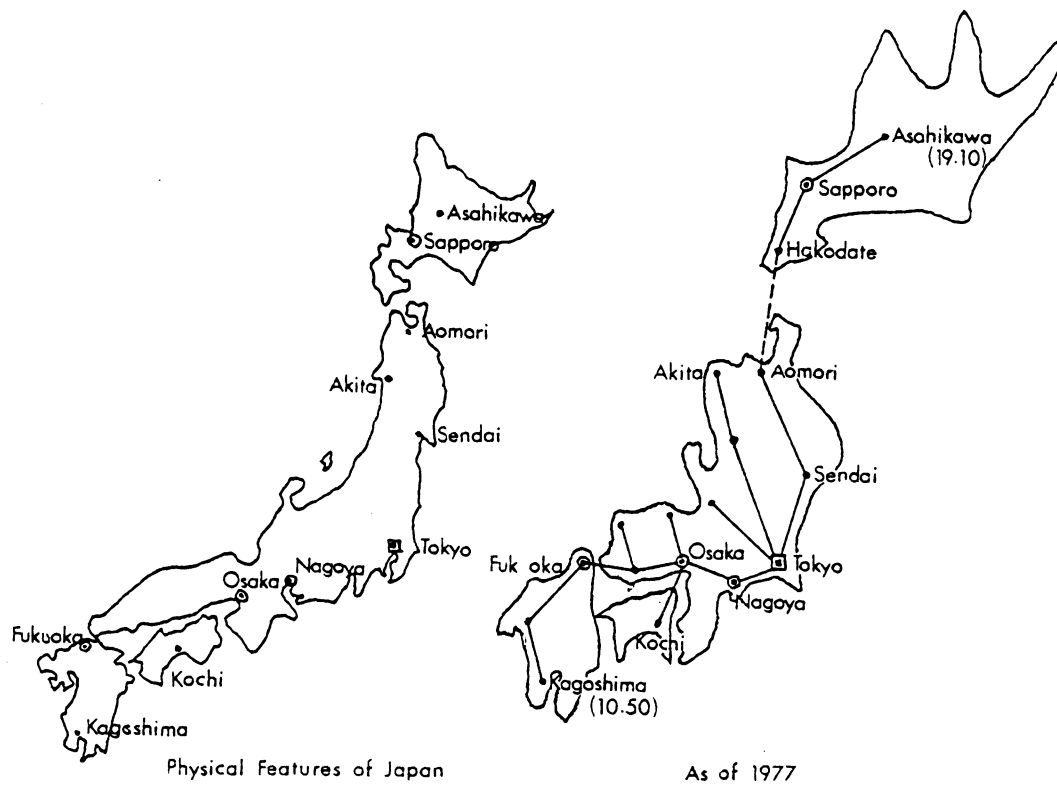


Figure III-0: Time-distance Configuration Map of Japanese Islands

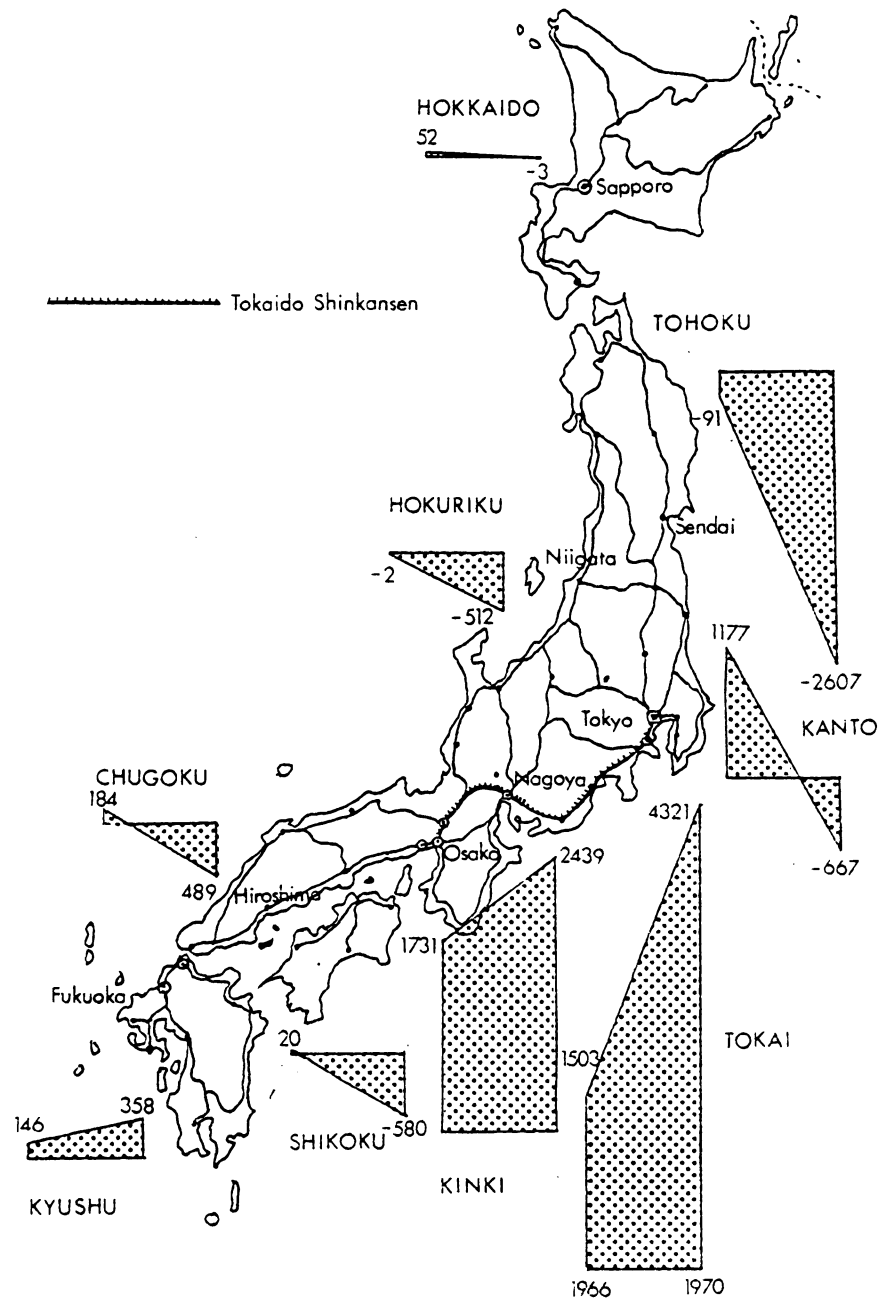


Figure III-1: Regional Economic Effects of the Tokaido Shinkansen: 1966-70
Growth of regional products by region - in 100 millions

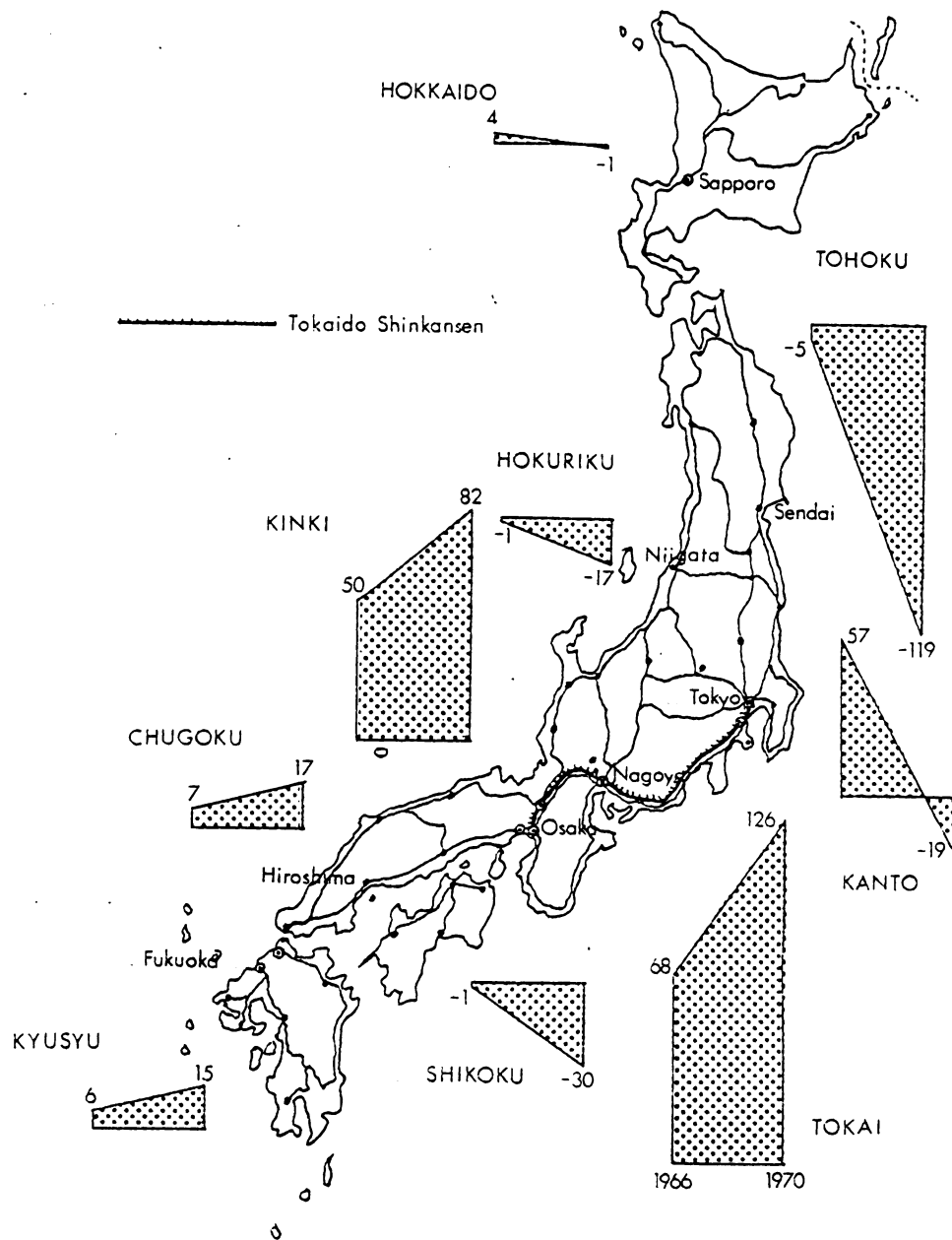


Figure III-2: Regional Economic Effects of the Tokaido Shinkansen: 1966-70
Growth of employees by region - in thousands

Table III - 1
Transition of Pivotal Administrator

		1960	1965	1970
Tokyo bloc	Pivotal Administrator	1,909 (27.8%)	2,835 (31.7%)	3,571 (31.4%)
	Executive/Managing Staff	322 (30.3%)	450 (31.8%)	633 (33.8%)
Across the Nation	Pivotal Administrator	6,872	8,947	11,355
	Executive/Managing Staff	1,065	1,415	1,876

SOURCE: Basic Data List for National Landuse Planning, p. 52.

IV. EVALUATION OF THE TOHOKU AND HOKKAIDO SHINKANSENS AND THE REACTIONS OF LOCAL GOVERNMENTS, CITIZENS AND PLANNERS ON ITS ROUTES

As mentioned in Section C (Methodology) in the Introduction, local governments for decades (even to this day) have had a markedly ambivalent attitude toward the Central Government; as detailed in Chapter II, this "passive" attitude has evolved gradually over the past century. Local governments have long manifested a desire to correct this relationship; not surprisingly, therefore, the expectations of local governments in the Tohoku and Hokkaido districts for the Shinkansen's development are acute, tinged with anticipation and apprehension. In the present chapter, the state of feeling of those governments is treated in full.

A. Theory of "Ukezara" in the Tohoku district:

Throughout the era of the Meiji government's strong centralism and a subtle centralism at the present day under the cloak of local autonomy, local governments have resigned themselves to their own inferior, secondary status in relation to the central government. This feeling is especially strong among local governments in the Tohoku district.

By its proximity to Tokyo, the Tohoku district has long been a labor supplier for industries in and around Tokyo. The cheap labor market in Tohoku has long been a powerful attraction for industries contemplating branching out. As a result, the Tohoku district has had to accommodate labor-oriented industries overflowing from high-wage urban areas. Further, because the main industry in the Tohoku district has long been agriculture, the central government's investment for

industrial growth there has been trifling. As mentioned before, the Tohoku district has received great benefits from the rice price policy of the central government; however, an over-production of rice in recent years had made the central government take the opposite policy of cutting off rice production, and this policy is becoming of vital importance for the Tohoku district.

Hence, as one result of a long-standing weakness in the economic base of Tohoku, there has been sharp internal strife among its prefectures against the induction of central capitals, especially public capitals has been very sharp. The Tohoku district has long existed with an ambivalent attitude toward the central government--on the one hand, recognizing its own dependence; and on the other hand, desiring independence.

Sharp contention of this kind among prefectures in the Tohoku District has also been incited by the Shinkansen Project. Miyagi prefecture wants to be the leader of the Tohoku district, and two prefectures along the Japan Sea, Akita and Yawagata, make no secret that they want the same for themselves. Sendai City of Miyagi prefecture wants to be the capital of the southern Tohoku district; and Morioka City of Iwate prefecture wants to be the capital of the northern Tohoku district. Over against the motivation of these two cities, other prefectural capital cities make no secret that they want the same for themselves. Nevertheless, a matter of primary concern common to all prefectures in the Tohoku district is the "counter-flow" effect of the Shinkansen. These prefectures share excessively bright expectations about the Shinkansen project, at the same time that they are well

aware of the negative impact which the Shinkansen would surely have.

A couple of interviewees in the Chamber of Commerce in Sapporo Sendai told this writer that their economies are "branch" economies. That is, they can't expect to have a pivotal administrative function in their relations with industries and the central government, but only a secondary administrative function, or branch function.

All of these passive and pessimistic attitudes have been called the "Ukezara" feelings. The term "Ukezara," directly translated into English, means "saucer." The significance is that a saucer catches liquid that overflows a cup. The term "Ukezara" was made by torturing this significance; it means that the Tohoku district has long received superfluities from the cup named "Tokyo."

Unless the central government radically alters its policy toward regional development, each prefecture's apprehensions will be realized again. Some city planning officials told this writer that the counter-flow effect of the Shinkansen can be avoided by leading investments; however, they held their tongues with respect to the source of revenue for leading investments.

In order to stimulate local communities, there would be no other way except a fundamental reform of the tax system in this nation; that is, the only way remained to revitalize local governments will be to change the ratio of tax sharing between present national and local taxes from 7 to 3 to 3 to 7.

On the other hand, the attitude of the Hokkaido district is fairly different from that of the Tohoku district. The Hokkaido district is composed of one prefecture, Hokkaido, and consequently its administrative

structure is quite clear. Also, thanks to its geographical remoteness from Tokyo, the Hokkaido has not suffered so much from negative impacts of Tokyo. Further, since the Meiji era, the central government has acted for the improvement of economic and social developments in Hokkaido. Furthermore, Hokkaido has two main parts for coastal shipping toward both the Pacific Coast and the Coast of the Sea of Japan and has not had important difficulties in transporting products. However, as for the movement of people and business, the Tsugaru strait between Hokkaido and Honshu islands has been an effect barrier. Accordingly, expectations are high for the Seikan tunnel of the Shinkansen. Hokkaido has been blessed with tourist resources, and the shortening of time-distance is sure to have a large positive influence on the tourism industry. Furthermore, by using the Seikan tunnel, jointly with freight traffic, the carrying capacity between Hokkaido and Honshu will improve exponentially. From these points of view, the Hokkaido looks forward to the Shinkansen in its territory. From such a removal, it is hard to recollect the negative feelings which are apparent in the Tohoku district.

In Sapporo City of Hokkaido, planning staffs told this writer that they are generally reluctant to have the Shinkansen in Sapporo City. They are wary of the influx of population from other districts. The planned population of Sapporo City in 1990 is 1.85 million. The present population is 1.19 million. Sapporo City has been improving its social overhead capital with its planned population in 1990 as a guide. Accordingly, there is understandable concern about the possible drastic impact of the Shinkansen upon population movement.

It is clear that the feelings of those two districts regarding the

development of the Shinkansen are different. One common object of these two districts is the correction of economic, social, and cultural differences with the three metropolitan areas, especially with the Tokyo bloc. Will the Tohoku and Hokkaido Shinkansens be the catalyst for realizing their wishes?

B. Positive Expectations as a Result of Various Planned Large-Scale Projects in the Tohoku and Hokkaido Districts:

By the conception of the "New Industrial City" authorized by the First National Comprehensive Development Plan (1962), the Tohoku and Hokkaido districts had five new industrial cities. Those are: Doou in Hokkaido, Hachinoe in Aomori, Seudaiwan in Miyagi, Joban-Koriyama in Fukushima, and Akitawan in Akita. As mentioned previously, those cities are not always blessed with the benefits of conception; that is, they do not always enjoy the positive introduction of employment opportunities. Joban-Kooriyama, in particular, is know as a typical case of the failure of this conception. A detailed reason is not apparent, but it may be due to the lack of incentives for industries and/or the unwillingness of local government concerned. At any rate, this "New Industrial City" conception has not given rise to the positive impacts expected by each prefecture and district.

By the Second National Comprehensive Development Plan (1969), the conception of developing five large-scale industrial bases was authorized. Those are the Tomakomai-Tobu in Hokkaido; Mutsu-Ogawara, in Aomori, Akitawan, in Akita; Nishi-Seto, between Yamaguchi, the southernmost prefecture of Honshu island and Kita-Kyushu district, especially Fukuoka and Oita prefectures; and Shibushi wan, in Miyazaki and Kagoshima

prefectures in the Minami-Kyushu district. All of these developments are for basic resource type industries such as steel, oil refining, electric power, and even a nuclear plant in Tomakomai-Tobu base. Benefits for regional economy have been strongly anticipated. However, the recession in the wake of the oil embargo, and people's concerns about environmental disruption have forced curtailment in the scale of these plans. Probably, as a part of the Third National Comprehensive Development Plan (expected to be announced by the Government in Fall, 1977) Nishiseto will be frozen permanently, and the rest will also be reduced in scale by as much as one half. However, such key industries as steel and automobile plants in the Tomakamai-Tobu, and steel and oil refining plants in the Mutsu-Ogawara and Akitawan, will have fairly strong impacts upon regional economy in these districts. Although recipient prefectures have been troubled with anticipated environmental disruption and concerted action by the residents, they seem to push these projects forward almost coercively. However, it will be a crucial problem for local governments that whole decision making process and even the right of decision concerning all of these big projects are held by the central government. Will the development of these coastal-type process industries and inland-type industries, which may be induced by the development of the Shinkansen and the Tohoku Interprefectural Highways, result in innovating and improving long-standing economic and social deficiencies of the Tohoku and Hokkaido districts?

On the other hand, many fairly large-scale projects are planned by prefectural levels in anticipation of the development of the Shinkansen and the Tohoku Interprefectural Highways. Let's pick out a few projects

which arouse our interest. In Hokkaido, besides the afore-mentioned "Tomakomai-Tobu" project, there are two big conceptions. Those are the conceptions of the "International Cargo Airport" and the "Electrification of Railways." The former conception is to enlarge present Chitose Airport and improve facilities for international freight from and toward North America and Soviet Union. The latter is to electrify at least trunk lines (present ratio of electrification in the Hokkaido is only 4.3 percent of the total route of 3,930 km) and to encourage regional development, and also tourism.

In Tohoku, the conception of a health and recreation base (permanent type) for old-age pensioners on the boundary between Miyagi and Fukushima prefectures (the planned population of the new town for the elderly is 40,000); the conception of the northern core city (the planned population is 70,000) in Miyagi prefecture; a submarine ranch for fish and shellfish in the Sendai Bay in Miyagi prefecture; and a large-scale freight distribution base in Iwate are worth notice.

It goes without saying that extraordinary funds will be needed to realize all of these plans. Unless the GNP leaps up by ten-odd times within a few years, such schemes can be nothing but an empty dream.

Not so as to end these projects in an empty dream, a tight coordination, and the exchange of conceptions for regional development among local levels, will no doubt be necessary.

C. Summation:

Passive and pessimistic attitudes toward the Central Government have long been common among local governments in Japan. Under present conditions almost all powers for decision making and implementation for

large-scale projects (even in territories under local prefectural jurisdiction) are controlled by the Central Government, as are the major proportion of local tax revenues. However, without breaking down this relation, there can be no real development of local areas. There are many meaningful and powerful measures which can and should be enacted by the Central Government. These measures are suggested and discussed in the following Chapters (V and VI).

V. EXAMINATION AND EVALUATION OF HYPOTHESES

To briefly recapitulate, the central hypothesis of this thesis is that the Tohoku and Hokkaido New Trunk Express Railways will catalyze socio-economic development in the Tohoku and Hokkaido regions.

Throughout the progress of developing the research base for this thesis, two pairs of contradictory concepts circulating in discussions of the urban and rural problems in Japan repeatedly caught the writer's attention. On one hand, it is commonly said that economies of scale are natural and inevitable; on the other, the evils associated with super-cities are deplored. Again, on one hand, it is freely argued that "centralism" is inescapable, while, on the other hand, it is said that the dispersion of the pivotal administrative functions (See footnote) is necessary.

Many who represent the first propositions in each of these pairs concede that the concentration of industries toward the Pacific Coast Belt Industrial Zone is a quite natural movement, because industries have always pursued the existing profits of accumulation, and this is the basic principle for industries. However, they say that it is hard to tolerate the congestion of automobiles, overpopulation, and environmental disruptions in big cities. Given a position so constricted by contradiction, about the only thing that will meet approval is the dispersion of industries to rural areas--which, in the circumstances now

Footnote: The pivotal administrative functions show the functions such as operation management, personnel management, general affairs, etc. in big enterprises, and various functions in central government offices such as supervision, compilation of the budget, etc.

prevailing, is highly improbable. Many representatives of the latter positions in each pair acknowledge that centralism has been a necessary evil in the development of Japan since the Meiji era (1868-1911). But, they essentially are in argument in asserting that an excessive concentration of pivotal administrative functions, whether it has been at the governmental level or private enterprise level, has given rise to overpopulation and concentration of industries; therefore, these pivotal administrative functions should move out from Tokyo. Because of their concession, their major proposition is not advocating real distribution of power. From a reconciliation of these conflicting ideas, the most that could be tolerated would be the transfer of the national capital or the construction of a new capital.

These ideas are not always intractable. As repeatedly mentioned, the policy of industrial dispersion such as the afore-mentioned conception of "New Industrial City" (See Chapter II) worked out by the Japanese government since the 1960's has obtained somewhat positive results to a certain extent; and, also, the idea of the transfer of the national capital on the construction of a new capital of Japan to disperse pivotal administrative functions, especially in this case, pivotal administrative control function from Tokyo has some merits. However, these ideas were not, and will never, be an effective way to resolve contemporary urban and rural problems in Japan. Yet, ever since these problems became the objects of public attention, many measures and policies predicated on the afore-mentioned contradictory theses have been suggested. Of all measures and policies proposed, the following represent possible workable alternatives:

- (1) Urban renewal, usually intend to build high-rise buildings and apartment houses, especially in major cities (The Call of Cities, 1976 and The Challenge to Over- and Depopulation, 1975);
- (2) Redistribution of industrial functions such as the conceptions of the "Pacific Coast Belt Industrial Zone: and "New Industrial City" ("Income-doubling Plan;" 1960 and the "Law for New Industrial City," 1962);
- (3) Redistrubution of commodity distribution functions (The Challenge to Over- and Depopulation, 1975, and the Japanese National Railways' study, not published, 1977);
- (4) Transfer of pivotal administrative functions (The 2nd National Comprehensive Plan (1969) and The Challenge to Over- and Depopulation, 1975);
- (5) Transfer of educational and cultural functions (The Challenge to Over- and Depopulation, 1975 and Kisho Kurokawa, architect);
- (6) Raising the autonomy and self-determination of central cities of local metropolitan areas to a higher degree of effectiveness;
- (7) Construction of a new urban complex within the Tokyo region; but as a counter-balance to the settlement densities of Tokyo (The Challenge to Over- and Depopulation, 1975 and the Japanese Government often announced on the paper);
- (8) Transfer of the National Capital to somewhere else (Tatsuo Matsui, Masaji-Suzuki, Ichiro Kono, and others);
- (9) Construcc:ion of new capital (The same as above);

- (10) Laissez-faire, with respect not only to economic development but to population patterns (The Challenge of Over- and Depopulation, 1975 and many other scholars).

Which of these alternatives can be expected to resolve urban and rural problems with enduring effectiveness?

Which alternatives will strongly contribute to regional development in the Tohoku and Hokkaido districts? Can combinations of these alternatives help urban and rural communities recover from the difficulties that have plagued them?

What kind of role can the Shinkansen play in these alternatives?

These questions are representative of the great number of possible additional ones which could be posed. The following evaluations of each of these alternatives are provided in anticipation of such probes.

Concerning the first alternative--Urban Renewal: The historical pattern has been that urban renewal in Japan in the past has only contributed to further concentration of industries in metropolitan areas. A primary objective of urban renewal in Japan has been the effective use of land; consequently, urban renewal has always meant an increased concentration of people and facilities on the site concerned. In this sense, urban renewal (as traditionally conceived) can not be depended upon to have altogether positive impacts on contemporary urban and rural problems. Also, a sky-rocketing land price and a tangle of property rights in metropolitan areas will make urban renewal unfeasible. Urban renewal in Japan from now on will succeed only if the government is enabled to exercise its right of eminent domain to expropriate land for social purposes (so far this has not been practical because of the

astronomical cost of land).

Secondly, the redistribution of industrial functions: So long as the functions redistributed are the secondary administrative or lower functions, the status of rural areas will not be enhanced. For instance, although the location of such key industries as steel, automobiles, electric power, shipbuilding, etc. in rural areas has been considered to have a fairly strong impact upon the areas concerned, the derived effects from these industries upon regional development will be minimal as long as the pivotal administrative functions are kept in the head offices in distant metropolitan areas. Namely, the greater part of profits and benefits from those industries will be siphoned over by the head officers.

Thirdly, with respect to the redistribution of commodity distribution functions, it would be rash to expect any drastic effects from this measure. The areas to which these functions can be transferred will be limited; that is, there is no reasonable basis for having a commodity (consumer goods) distribution center far remote from consumers from economic viewpoints. Such an arrangement is inevitably uneconomical. The maximum range for location of these commodity distribution centers for food, clothes, sundries, etc. will be 20 to 40 km from consumers (Toshio Sanuki, "The Construction of Information and Commodity Distribution Cities and Measures for Forming Its Network," The Challenge to Over- and Depopulation, 1975). Although Japanese National Railways is planning to build such commodity distribution centers in a couple of places within the Tokyo Metropolitan Area for the purpose of the revitalization of the freight carrying function, all of these planned

are within 30 to 60 kilometers (The Reference Source published by the JNR. "With respect to the freight transportation within the Shuto bloc," 1976) from the core of Tokyo. Although this measure will be quite useful in the large urban regions for reducing the concentration of trucks involved in commodity distribution, it can't be expected to have much of an effect on rural areas, except the so-called "hinterlands" around the major urban areas.

The fourth alternative, the transfer of pivotal administrative functions--especially, the transfer of the central government's function from Tokyo--has been advocated by many officials, scholars, and planners. Many say that the transfer of pivotal functions of private enterprise would be prohibitively difficult at the present time; however, it may not be so difficult for the Central Government to change the location of its operations. Further, many say that, even supposing that all of the Central Government's functions can not move out from Tokyo, some of those may be able to move, and this depends solely on the Central Government's decision. In fact, this idea was under consideration by the Central Government a couple of times. In the "Income-doubling Plan" in 1960, the Government stressed the necessity of the dispersion of the heavy concentration of functions. Also, in 1963, the then Minister of Construction, Ichiro Kono, accepted a suggestion of the Institute of City Planning, and ordered research studies for a plan and program for transferring the Central Government's functions to the base of Mt. Fuji, almost 100 km west of Tokyo. Besides these, a couple of other ideas were discussed by the government agencies and various scholars. However, none have ever been realized. Although the basic idea might be

quite workable for reducing congestion in Tokyo, unless the important decision-making and implementing powers are decentralized as well as mundane administrative functions, it is not an effective scheme at all for rural areas.

The fifth measure, the transfer of educational facilities to rural areas, is also advocated by many people. As a first step, the Japanese government planned and built the "Campus City" in Tsukuba town in Ibaragi prefecture, approximately 60 km distant from Tokyo. The Japanese government is in the process of the relocation of approximately 40 government research institutes and laboratories, and finished up to locate there the Tokyo University of Education, which has since changed its name to Tsukuba University. This "Campus City" project has been judged a significant first trial; however, it has not been followed by other projects of the same nature, and also, its effect in terms of the dispersion of population has been minimal. One obvious reason for this is that these research institutes and single departmental colleges do not have the attraction of a large population. Further, in this case, as the Tokyo University of Education made strenuous opposition to this shift, the transfer of high-educational institutions will be very difficult from the viewpoint of the drastic change of educational circumstances.

Sixthly, with respect to the upgrading of local core cities such as Sapporo, Sendai, Hiroshima, and Fukuoka and other prefectural capital cities, the tendency of reduction of the problem of over population in the three greatest metropolitan areas has previously been described (Chapter II, Section C). Namely, since 1970, the movement pattern has

undergone some change. Since this alternative intends to increase the population of the above cities up to 1, or in some case, 2 million, as a practical problem, it must be unrealistic. In short, the conception of exerting influence from above is out of keeping with the reality of the local core cities concerned. According to this writer's research, these core cities, especially already highly developed cities such as Sapporo (1.2 million residents), Sendai (580,000 residents), Hiroshima (820,000 residents), and Fukuoka (945,000 residents) are quite reluctant to a drastic increase of their population. Accordingly, it may safely be said that this alternative ignores the concerned core cities' intention.

The seventh conception, that of constructing a new complex city within the Tokyo region; but as a counter-balance to the settlement densitites of Tokyo, is now being researched. The project name is "Kita-Kanto Large-Scale City." In 1972, the Japanese government appropriated ¥200 million (approximately \$700,000) in the budget for researching this concept. The planned population of this new city is scheduled to be 1.0 to 1.5 million. The territory of settlement is planned to straddle the boundaries of Ibaragi, Tochigi, and Gunma prefectures, all of which are located north of Tokyo. The most remarkable (and convenient) characteristic of these three prefectures is that each has almost the same area of habitable flatland altogether as that of the Tokyo Metropolitan Area (approximately 8,750 km²). However, the population of each of these three prefectures is less than one fourth that of the Tokyo Metropolitan Area (5.8 million persons). The merits of this conception of the "Kita-Kanto Large-Scale Complex City" (See Map V-1) are cited

by authorities and Yoshimari Norota (The Challenge to Over- and Depopulation) as follows:

- (1) This area is blessed with huge rice fields, farmland, and forests, and as described above, with a good deal of habitable land;
- (2) It is located in the point of contact between the Tokyo Metropolitan Area and the Tohoku, Hokkaido, and Joshinetsu (Niigata and Nagano prefectures) districts, which will be developed as the initial base of food production in the future;
- (3) This area has a fairly large labor force, which is explained by the rapid increase of new enterprises such as metal goods, general and precision machines, transportation machine, printing and publishing, apparels, furnitures, etc. in this area in recent years (According to the Basic Data Book of National Land Planning, 1975, this area occupied 4.6 percent of the total output of the above industries in Japan in 1960; 6.2 percent in 1965; and in 1970, its share attained 7.4 percent);
- (4) This area is only approximately 100 kilometers from the center of Tokyo (See Map V-0), and as a result, there would be no serious communication problems;
- (5) This area has formed into a bloc with a daily base relatively independent from the Tokyo area; consequently direct influence from Tokyo would not be very strong from now on; and

(6) There are five middle-size cities such as Mito (195,000 residents) and Hitachi (203,000) in Ibaragi prefecture; Utsunomiya (340,000 in Tochigi prefecture; and Maebashi (250,000) and Takasaki (210,000) in Gunma prefecture, and these cities will play important secondary functions for the new planned complex city.

In this writer's opinion, this idea may be linked up with the Tohoku and also, the afore-mentioned Joetsu Shinkansens (See Chapter I) by establishing the Shinkansens' terminals in cities within this area. If terminals are solidly developed in Utsunomiya and Takasaki (See Map V-1, a junction city of the existing two JNR's main lines); the effect may be to help prevent the counter-flow of population from hinterland regions into Tokyo which has so invariably attended new Shinkansen routes. Also, this area, with cities of 1.5 and 1.8 million (Kita-Kanto City and Sapporo City) at either end, and a city of 1 million (Sendai) in the middle, will be able to organize a new and relatively independent economic bloc separate from the existing three metropolitan areas. (These will be discussed in detail in the Chapter of the conclusion of this thesis). However, it will be extremely difficult for the Japanese government to realize the decision not to extend the Shinkansen into metropolitan areas, especially into Tokyo; however, nothing but such a drastic action can resolve urban and rural problems simultaneously.

Alternatives 8 and 9, the transfer of the National Capital to another site, and the construction of a new capital, as mentioned before, have been discussed by the Central Government fairly frequently. The afore-mentioned conception of the transfer to the base of Mt. Fuji was



the most realistic at one time, and further, the transfer to the Hamanako area in Shizuoka prefecture was publicly talked about. In recent years, the conception of the transfer of the National Capital revives as the assignment of the Central Government to be seriously discussed. For example, consider the vision of "Neo-Tokyo" advocated by the 21st Century Research Institute, represented by Masaji Suzuki. This vision is to transfer the Capital to the Pacific Coast between Yaizu and Hamamatsu Cities, both in Shizuoka prefecture, by constructing a man-made island on the Ocean. Another idea is called the "Kitagami Sento Ron (The Theory of the Transfer of the National Capital to Kitagami area in Iwate prefecture)" advocated by the member of the "Research for the 21st Century of Japan" in Waseda University, represented by Tatsuo Matsui, (The locations of these conceptions are shown on the Map V-2). However, as shown in the cases of the capital cities of Brazilia in Brazil and Canberra in Australia, the construction of new capitals requires an extremely long period of time and great expenditures, and sometimes the rushed design schemes for such projects ignore human needs. Urban and rural problems in contemporary Japan need prompt treatment; so that a time-consuming project such as the construction of a new capital is not a realistic proposal for solving immediate pressing problems.

The last alternative of "Laissez-faire" came from the recognition of current movement of population. As repeatedly mentioned, the influx of population into the three greatest metropolitan areas has been gradually declining. Accordingly, even if left alone, the condition of present metropolitan areas will never be worse than now. Adherence to this attitude claims that where such bureaucratic measures as urban

renewal, dispersion of industrial functions, transfer of pivotal administrative functions, transfer of the National Capital, construction of a new capital, etc., advocated by the government in the past have yielded unsatisfactory results, the natural operation of people's wisdom is gradually solving the problems as by a biological adaptation. "Laissez-faire," then, might be the best way at the present time.

It is obvious that none of these alternatives would have very important impacts upon contemporary urban and regional problems in Japan. Probably, these bureaucratic measures, especially the measures which force population and other various functions to move somewhere else, could never have succeeded before, and will never be successful in the future.

As a natural consequence, many began to suggest a drastic reform of legislation. One of these is the drastic suggestion made by Junjiro Takahashi of Keio University with respect to the intensification of the Anti-Trust Act, and the reform of the national and local tax system. Takahashi judges that the gravitation of population and concentration of industries into three greatest metropolitan areas, especially into the Tokyo area, has resulted in the emergence of pyramid-type industrial activities--large-scale enterprises such as apex. And these large-scale industries have had a strong connection with the central government, especially administrative authorities such as the Ministry of International Trade and Industry; the Ministry of Finance; the Ministry of Construction; the Ministry of Agriculture and Forestry; the Ministry of Transport, and so on. Consequently, in order to operate efficiently, these large-scale industries must have

head offices in Tokyo. In fact, according to a report by the Tokyo government (Tokyo Metropolitan Prefecture, Middle-range Planning, 1974) in 1970, 70 percent of enterprises with capital of more than ¥5 billion (approximately \$18 million) have had their headquarters located in the Tokyo area. The same figure in 1960 was 54.3 percent. Moreover, it often is the case that small-to-medium sized enterprises are dependent for their existence on a subcontracting industries in this pyramid-type organization. Accordingly, Takahashi believes that, by reforming the Anti-Trust Act, the size of this pyramid will be reduced, and the freedom of small-to-medium sized enterprises will also increase. This idea also has been discussed repeatedly over the past ten years in the Diet, and attempts have been made to introduce appropriate legislation; however, actual passage of such legislation remains in suspense.

Takahashi's second suggestion, the reform of national and local tax system, is also very drastic. In Japan, the status quo of local autonomy has long been called the "30 percent" autonomy. It means that the ratio of local tax revenue within the total revenues of the local governments has been around 30 percent on the average. The rest, 70 percent of the total revenues, has come from the central government in the form of tax allocation, or tax sharing, to local governments, National treasury disbursements, etc. As a natural consequence, the intervention of the central government in the local autonomy has been strong. Therefore, Takahashi asserts that intensification and increase of local taxes are inevitable to make the local governments plan their own communities freely. The present writer is of the same opinion. Unless the "30 percent" autonomy is broken down, a real local development

will never occur. However, again, this reform has been discussed for a long time, and its realization is no more than a remote possibility.

Hence, almost all trials and suggestions in the past have collapsed in vain, or ended as castles in the air.

Is it impossible to find appropriate ways to resolve the problems being faced in Japan without resort to the above-mentioned alternatives? On the other hand, things are getting serious, especially in the Tokyo area. For example, the Economic Planning Agency of Japan formed the conclusion that the maximum manageable population in the Tokyo Metropolitan Area will be 28.7 million as of 1985, increasing 4.6 million from the population in 1970. This max capacity limit has been calculated from such parameters as natural environment, industrial activity, housing and educational facilities, electric power, commuting time, garbage treatment, and distribution of perishable foods. On the other hand, according to the 2nd National Comprehensive Development Plan, it is estimated that the population in the Tokyo Metropolitan Area will be between 33.5 million and 38.1 million in 1985. If the estimate of the Economic Planning Agency is trustworthy, it can readily be imagined what problems will beset the Tokyo Metropolitan Area in the future. From this vantage, the afore-mentioned alternative of "Laissez-faire" loses much of its theoretical rationale.

Throughout the studies, one idea struck the writer favorably, that which was advocated by Professor Chikaraishi of Hosei University (This idea is introduced by Yoshimari Norota in the Challenge to Over- and Depopulation) proposing that the aids for universities should be increased by 1 percent of the national income (which is equivalent to

¥940 billion, \$3.4 billion, as of 1973). In addition, one-half of this increased money should be poured into private universities and colleges in big cities, especially the Tokyo area, and enable them to reduce the number of enrolled students, and other half should be poured into national and prefectural universities and colleges in rural areas enabling them to increase the number of students. This suggestion has significance because, as of 1971, 47.4 percent of university or college students (813,575) are in the Tokyo area (Basic Data Book, 1975), and the greater part of these students are settling after graduation in the Tokyo area. According to Keihachiro Shimizu and Keijiro Hattori (The Call of Cities, 1976), as of 1965, 49 percent of all university and college graduates were living in the Tokyo Metropolitan Area, and almost 70 percent of those students were living in the Tokyo metropolitan prefecture. Another source (Masahiko Honjo, "Tokyo: Giant Megalopolis of the Orient, World Capitals Toward Guided Urbanization, 1975) says the same figure in 1960 was 45 percent; so, this clearly illustrates continuous influx of students into the Tokyo Metropolitan Area. If a lid can be put on the influx of students (in other words, the younger generation) to the Tokyo area, the effect on the problems of population dynamics will be powerful.

Once rural district had many universities, high schools and junior high schools with their own particular school traditions and curriculums. The youth who strongly desired learning dispersed throughout the nation in pursuit of those peculiar school traditions and curriculums; however, by the introduction of the new system of education after the Second World War, these special and unique traditions were diluted,

and further, the substantial increase in the rate of attendance in the upper levels of education in the post-war period has induced the establishment of a number of new private universities and colleges. In fact, the rate of attendance in university and college has grown from 3 percent in 1935 to more than 20 percent nowadays. To make matters worse, financial aid from the National Government to these private schools have long been inadequate; consequently, private schools have experienced instability in their management. In this sense, Chikaraishi's idea will be useful in revising the former spirit and unique traditions of local universities and colleges, and, needless to say, such revitalization will benefit rural communities.

Through the studies, the following demographic points became clear.

- (1) The rate of social increase (migration, in other words) in the three greatest metropolitan areas such as the Tokyo Metropolitan Area, Nagoya Metropolitan Area, and Osaka Metropolitan Area has been falling in recent years;
- (2) Nevertheless, the populations of these three metropolitan areas are still increasing due mainly to natural increase;
- (3) The gravitation of population toward large local core cities such as Sapporo, Sendai, Hiroshima, and Fukuoka and the capital cities in prefectures such as Morioka, Aomori, Kumamoto, Kagoshima, etc. has emerged as remarkable phenomenon in recent 10 years (Basic Data Book, Part II, 1976);
- (4) The exodus of the younger generation from rural areas toward the three metropolitan areas is still continuing;
- (5) The decrease of workers in the primary industry (e.g.,

agriculture, mining, and fishing) has been quite conspicuous; an especially serious problem has been young people's desertion of agricultural industry.

In industrial and commercial contexts, the following points have emerged as significant:

- (1) The policy of industrial dispersion encouraged by the Japanese government has promoted a minor rate of dispersions with somewhat positive results in recent years;
- (2) However, more drastic trials such as the conception of the afore-mentioned "New Industrial City" have not always achieved their original aims;
- (3) Various environmental disruptions due to the past rapid economic growth, especially the contamination of the inshore waters has been making the establishment of new large-scale coastal type process industries almost impossible;
- (4) Nevertheless, according to the National Government's Statement (The Asahi, 11 June 1977), as of 1985, steel production capacity will be 15 million tons less than the needs at that time; further, the daily production of refined oil will fall short of the needs by 1.8 to 2.6 million barrels; only electric power will be able to supply sufficient amounts. In anticipation of such problems, the Central Government is now pushing for an expansion of the industrial base (that is, the enlargement of steel production, oil refining, etc.). Such a

policy, if pursued to its logical conclusion, cannot but result in much worse contamination of water, soil, air than now exists, unless pollution controls are instituted forthwith and rigorously enforced;

- (5) Recently, some inland industries have been re-examined with care because of serious water contamination which has attended the development of counterpart coastal industries;
- (6) The food problem facing Japan in the near future is fairly serious, and as a result, the conception of a food base in rural areas such as Hokkaido, Tohoku, and Kyushi districts has been reconsidered;
- (7) On the other, the government's policy of discouraging rice-production (because of a surfeit; See Chapter II, Section B, 3) has had a negative impact on the Tohoku's economy.

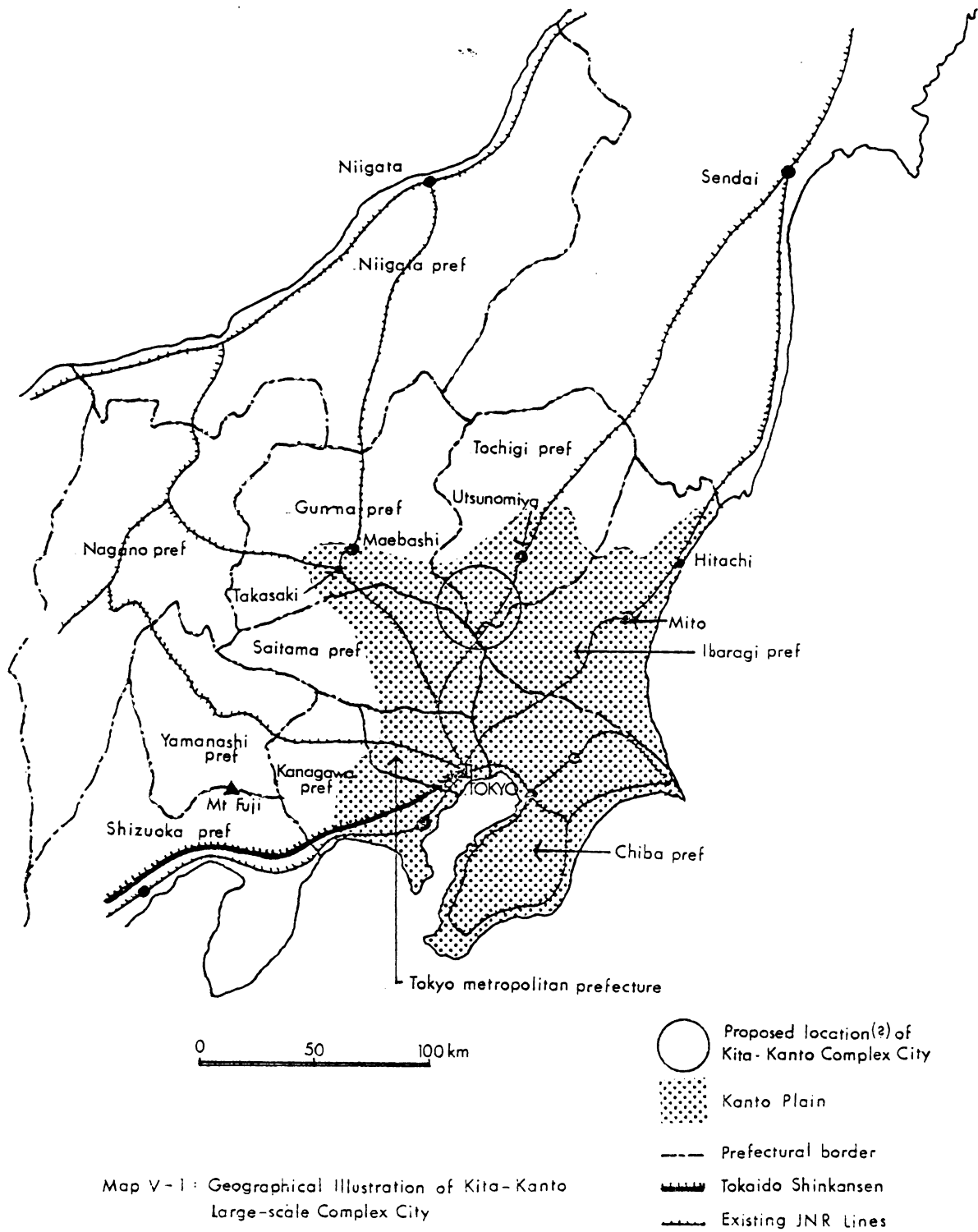
In terms of the impacts of the Shinkansens already built and operating (The Tokaido and Sanyo Shinkansens), the following points are judged to be very significant for evaluating the probable impacts of the Tohoku and Hokkaido Shinkansens:

- (1) The derived effect of the Shinkansen, especially that of the Tokaido Shinkansen, generating the concentration of population and industries, was extremely strong;
- (2) The impact of the Sanyo Shinkansen on the Sanyo and Kita-Kyushu districts fell short of the social and economic expectations by the recipient districts concerned;

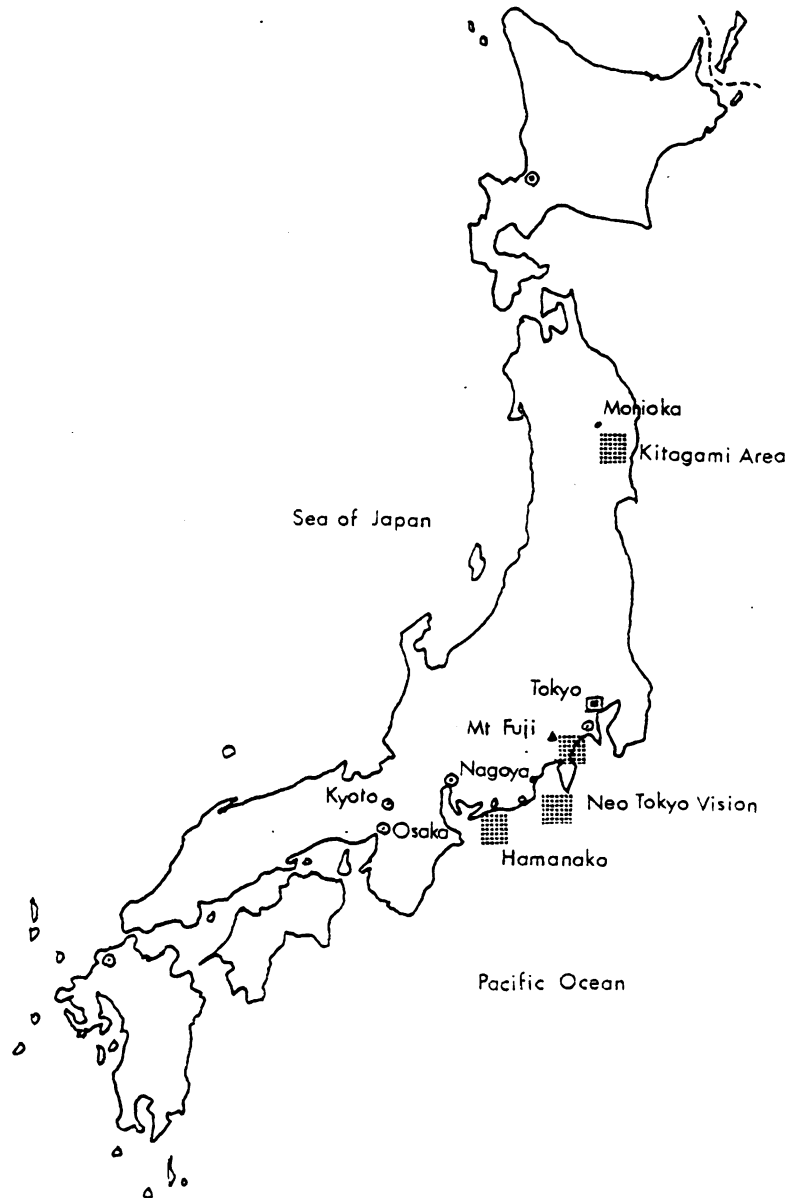
- (3) By the extension of the Shinkansen into Hakata, it has been said that Fukuoka, the largest commercial city in the Kyushu district, was included in the sphere of economic influence of the Tokyo bloc, and on the other hand, the economic position of Osaka and Nagoya fell down on the whole;
- (4) According to the Amano Model, the Tohoku and Hokkaido Shinkansens should be expected to help resolve regional differences; however, even Amano stresses that other strong supports inevitably are needed to double the Shinkansen's effects upon regional developments;
- (5) The transport efficiency of the Shinkansen was incredibly high. Its effects in terms of the shortening of time-distance, conservation of energy, and safety should be highly evaluated;
- (6) Among its negative impacts, the extension of the Shinkansen often induced land speculation and over-supply of commercial facilities;
- (7) Also, the extension of the Shinkansen sometimes required fairly large expenditures at local government levels to improve related facilities;
- (8) The noise and vibration due to the Shinkansen has become the prime object of attack by the environmentalists and the residents along the routes.

In light of the negative resultants noted, without strong supporting

measures to bring about the Shinkansen's positive effects, the Tohoku and Hokkaido Shinkansens will not catalyze socio-economic development in the Tohoku and Hokkaido regions.







Map V-2: Various Conceptions concerning the Transfer of the National Capital & Construction of a new Capital

VI. CONCLUSION

In light of various restraints mentioned in the previous chapters, the following measures to resolve the contemporary urban and rural problems as much as possible are recommended for consideration:

- (1) The Tohoku Shinkansen should not extend into Tokyo.

Stopping the Shinkansen at the places which are 100 km from Tokyo will effectively avoid further accumulation of population and industries in the existing metropolitan areas;

- (2) An economic and social evaluation of five existing middle-sized central cities (See Map V-1) in the proposed Kita-Kanto regional urban constellation will be essential.

Also necessary will be readjustment of those economic and social functions, and the supplementation of necessary functions for the above Kita-Kanto regional urban constellation such as pivotal administrative functions of enterprises and/or high-level governmental agencies.

Then, there will be a need to establish the terminal of the Tohoku Shinkansen in Utsunomiya and that of the Joetsu Shinkansen in Takasaki (See Map VI-1). Mito will play an important role as the east-end gateway to the Kita-Kanto City. The distance from Hitachi, which faces the Pacific Ocean, to Takasaki, which has long been a pivotal city for the regions along the Japan Sea, is approximately 150 kilometers (90 miles). These five cities will have to be linked by both highways and

railways. This new linear shaped metropolis will develop the Utsunomiya as its core and Takasaki and Mito as its subcores. Planned population would be between 2.5 and 3 million. An expected average density of population within this linear shaped complex city is 1,000 persons per square kilometer;

- (3) The expansion of locally-situated national universities and prefectural universities and colleges is inevitably necessary. This measure will be the only way to encourage the younger generation's settlements in rural areas. Like state universities in the United States, national and prefectural universities should be much larger than private institutions. However, at the present time, most of the larger schools are private institutions, in contrast to the pattern of many large public universities and colleges in the United States. Also, the development of the Shinkansen will spur the interchange between these cultural cities backed up by huge national and prefectural universities (This tendency, the rapid increase of the interchange among local cities, has clearly emerged among cities along the Tokaido and Sanyo Shinkansens);
- (4) Restudy the necessity of increasing the number and kind of inland-type industries should be thoroughly done. The corridor between Sendai and Morioka in the Tohoku district will be a quite suitable site for inland-type industries; exhaustive use of the existing Tohoku Main

Line (from Tokyo to Aomori via Sendai) for shipping goods from these industries must contribute to the boosting of the Tohoku district's economy;

- (5) Further, reform of the agricultural structure in the Tohoku district must be speeded up. The transition from rice production to fruit and vegetable production, and also the shift to dairy farming (the Kitagami plateau in Iwate prefecture and Hokkaido will be the most appropriate sites), has to be made, and simultaneously, the introduction of large-scale farming to attract the younger generation should be seriously studied.

At any rate, in the coming decades, a matter worth due consideration will be how to limit the movement of the materials and human beings in terms of energy conservation. By limiting the sphere of economic influence to certain areas, energy loss due to the long-haul transportation of industrial products can be minimized. By organizing a fairly self-sufficient economic bloc on regional bases, for instance, the Hokkaido and Tohoku bloc, Kanto and Chubu bloc, Hokuriku and Kinki bloc, and Chugoku, Shikoku, and Kyushu bloc (See Map VI-2), the effective use of natural and human resources will be facilitated. Further, the direct import and export to and from each economic bloc will save enormous amounts of energy when compared to the inefficient system, now in force, of siphoning goods first through such trade centers as Tokyo and Osaka. This thought has something in common with the conception of the "Internatinal Cargo Airport" being planned by the Hokkaido government.

Furthermore, by regulating the operation of the Shinkansen within

each economic bloc, effective use of the Shinkansen will be quite possible because the optimal distance of operation of the Shinkansen has been established to be 500 to 600 kilometers. Granted, the adoption of this plan would mean, for the present, that regional differences between economic blocs would remain; these differences can only be resolved by the constituent members of each bloc.

Under the Japanese government's principles of regional equality as presently conceived (Characterized by such policies as the so-called "30 percent" local autonomy), local autonomy can never make strides. Henceforth, planning for new regional developments should observe certain constraints:

- (1) Any development having possible the effect of stimulating the gravitation of population and concentration of industries in specific areas should be avoided;
- (2) Any development which will spur unnecessary consumption of energy should be avoided;
- (3) Serious consideration for local needs should come first; and
- (4) Traditional local culture should be carefully preserved.

The author has made some original suggestions for resolving urban and rural problems, such as measures for growth control, the intensification of local autonomy, the formation of regional economic blocs and the limited use of the Shinkansen within each bloc; also, strongly endorsed in the preceding examination have been such proposals as the expansion of locally-situated national universities and prefectural universities, the reform of the national and local tax structure, and also the conception of the "Kita-Kanto Large-Scale City" (if it can be

linked with the conception of the Shinkansen terminal). However, it may be that none of these ideas would be met with approval in present-day Japan, where a strong centralism still prevails, and where it is still believed that a possible way to resolve the urban and rural problems is the dispersion of industry and urban redevelopment, and to make matters worse, where concerted action by the residents for public and private projects is still construed as an anti-Establishment movement.

However, it is evident to everybody that drastic measures such as those mentioned above are necessary if we want to utilize the Shinkansen which was originally useful in populated areas such as the Tokaido Megalopolis for resolving regional differences, and if the Central and local governments seriously want to resolve problems of too heavy and too light population concentrations within each area.

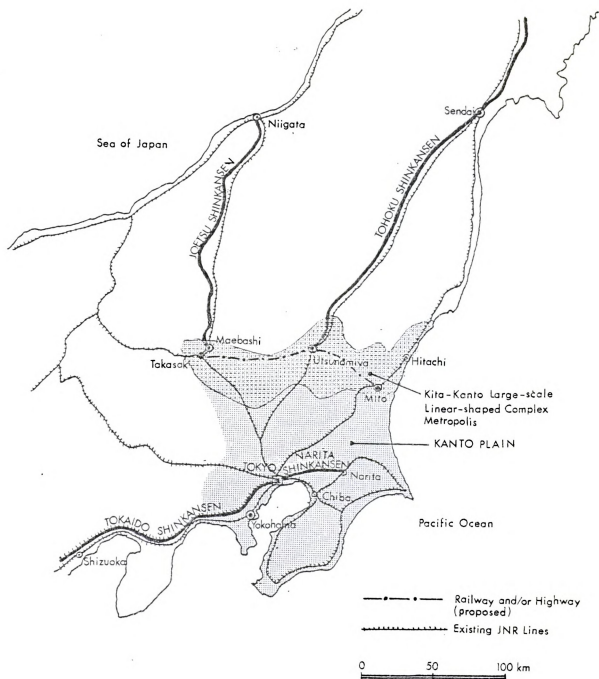
Specific urban and rural problems in Japan have been discussed, but how about problems in the United States? Contemporary problems in the United States are high unemployment, grievances of minorities, the economic deterioration or stagnation of the status of the East Coast and Midwest, fiscal strains of big cities (a common problem in all states), and energy conservation. Possibly the Japanese type Shinkansen can be utilized in the United States. A recent newspaper article reported that JNR made a consultant contract with AMTRAC concerning the development of a high-speed railway transit between Washington, D.C. and Boston via New York.

As shown in the Amano Model, the Shinkansen type railway system will be quite effective within densely populated areas such as the East Coast of the United States. However, concerning the real effects of the

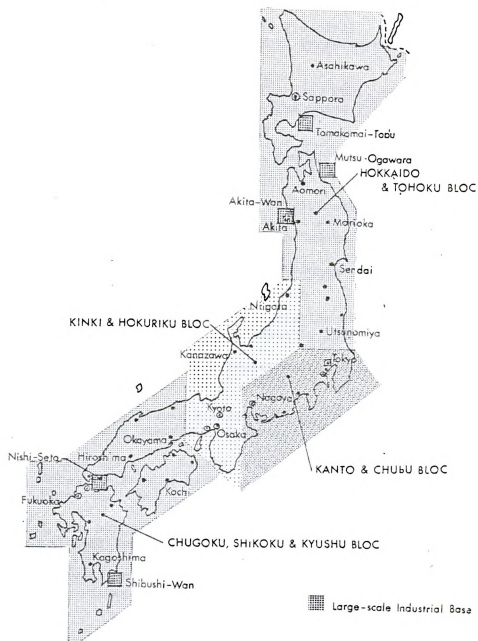
Shinkansen type rail transit upon the East Coast, further research will be needed. The effects of the Shinkansen type transit upon the conservation of energy will be staggering if it is used to this purpose, and a key element for achieving such positive effects is an efficient distance of operation of the Shinkansen type transit. As mentioned before, the optimal distance of operation of the Shinkansen has been established to be 500 to 600 km; so considered, the plan may be economical if this condition is taken into account.

When opportunity permits, the author will be in charge of further research on the possible impacts of the Shinkansen type rapid rail transit system on major metropolitan areas in the United States, such as the East Coast Corridor, and will then try to analyze the possible impacts quantitatively as well as qualitatively. Such research could yield insights and data which could be of some value to planners in this country.

At any rate, the Tohoku Shinkansen and the Seikan tunnel are underway. Unless local governments and citizens take rock-ribbed measures to protect their own environment, as well as natural and human resources, the Shinkansen will become a gigantic suction pipe, and absorbing whole populations and sending them to the existing metropolitan areas. Only when local governments free themselves from an administrative structure which is a miniature of the Central Government will locally generated and operated programs for regional developments come into being; only then will the Shinkansen be an important supplemental measure for realizing the programs concerned.



Map VI-1: The Conception of the "Kita-Kanto Large-scale Linear-shaped Complex Metropolis"



Map VI- 2: Economic Blocs (proposed)

Selected Bibliography

In Japanese:

Governmental & Quasi-Governmental Publications:

- Aomori-ken Kikakubu (Aomori Prefecture, Dept. of Planning). Dai 4 ji Aomori-ken Choki Sogo Keikaku (The 4th Aomori Prefecture Long-range Comprehensive Planning, 1976.
- Fukushima-ken Kikaku-Kaihatsubu (Fukushima Prefecture, Dept. of Planning and Development). Fukushima Kensei Yorán (Fukushima Prefectural Handbook), 1976.
- Fukushimaken (Fukushima Prefecture). Fukushima Kensei Choki Tenbo (Fukushima Prefecture Long-range Planning), 1970.
- Hokkaido Kaihatsu Choseibu (Hokkaido, Dept. of Development & Coordination). Hokkaido Shinkansen Tetsudo Kensetsu ni Jansuru Shiryo (Sources for the Construction of the Hokkaido Shinkansen), 1973.
- Hokkaido Kaihatsu Choseibu (Hokkaido, Dept. of Development & Coordination). Hokkaido Yorán (Hokkaido Handbook), 1976.
- Iwate-ken Tokei Kyokai: (Iwate Prefecture, Association of Statistics). Iwate Kensei Yorán (Iwate Prefectural Handbook), 1976.
- Iwate-ken (Iwate Prefecture). Shin Iwate Kensei Hatten Keikaku. (The New Iwate Prefecture Development Plan), 1971.
- Iwate-ken Tochi Kaihatsu Kosha (Iwate Prefecture Land Development Corp.) Iwate Ryutsu Senta (Iwate Distribution Center), 1976.
- Kokudo-cho (National Land Agency) & Kokudo Keikaku Kyokai (Land Planning Assoc.), ed. Kokudo Keikaku no Kiso Shiryo (Basic Data Book of National Land Planning), Part 1, 1975, & Part 2, 1976.
- Kokudo-cho (National Land Agency), ed. Kokudo Riyo Hakusho (The White Paper of National Land Use), 1976.
- Miyagi-ken Kikakubu (Miyagi Prefecture, Dept. of Planning). Miyagi-ken Choki Sogo Keikaku (Miyagi Prefecture Long-range Comprehensive Planning), 1972.
- Miyagi-ken Kikakubu (Miyagi Prefecture, Dept. of Planning). Miyagi Kensei Yorán (Miyagi Prefectural Handbooks), 1976.

Miyagi-ken Tohoku Shinkansen Kensetsu Suishin Honbu (Miyagi Prefecture, the Headquarters of the Promotion of the Shinkansen Development). Tohoku Shinkansen no Kensetsu Koka to Chiiki Seibi no Hoko (The Construction Effects of the Tohoku Shinkansen and the Direction of Regional Development), 1975.

Sapporo-shi Kikaku Chosei Kyoku (Sapporo City Bureau of Planning & Coordination). Sapporo Shisei Gaiyo (Outline of Administration of Sapporo City), 1976.

Tokyo-to (Tokyo Metropolitan Prefecture). Toshikeikaku Gaiyo (The Summary of City Planning), 1973.

Tokyo-to (Tokyo Metropolitan Prefecture). Tokyo-to Chuki Keikaku, 1974 (Tokyo Metropolitan Prefecture, Middle-range Planning, 1974), 1974.

Tokyo-to (Tokyo Metropolitan Prefecture). Tomin o Kogai Kara Boshi Suru Keikaku (Plan to prevent the Tokyo Citizens from Environmental Disruptions), 1974.

Non-Governmental Publications:

Asahi Shinbun (Asahi Newspaper). Minryoku, Bessatsu 1961-70; 1972; 1976 (Prefectural Powers and Resources, Extra Copy 1961-70; 1972; 1976).

Kyushu Keizai Chose Kyokai (Kyushu Economic Research Assoc.) Shinkansen Noriire to Kyushu Keizai (The Extension of the Shinkansen into Kyushu and Kyushu Economy), 1976.

Nihon Keizai Kenkyu Center (Japan Economic Research Center). Doro to no Kanren kara Mita Tetsudo no Seibi ni kansuru Kenkyu Hokokusho (The Research Report concerning the Improvement of Railway and Its Relationship with Highways). Part II & III, 1969.

Nihon Chiiki Kaihatsu senta (Japan Center for Area Development Research). Dai 3 kai Chiiki Kaihatsu Kokusai Sinpojium (The 3rd International Symposium on Regional Development). Tokyo: Nihon Chiiki Kaihatsu Senta.

Sapporo Shoko Kaigisho (Sapporo City, Chamber of Commerce). Keizai Tokei Nenpyo (Annual Report of Economic Statistics), 1976.

Shutoken Sogo Keikaku Kyokai (The Shuto Bloc Comprehensive Planning Assoc.). Shuto-ken no Miraizo (Future of the Shuto Bloc), Part 2, 1970.

Unyu Chosa-kyoku (Transportation Research Bureau). Shinkansen ni Okeru Toshi keisei no Senryaku-sei (The Strategic Merit of the Shinkansen for Urban Formation).

Unyu Keizai Kenkyu Senta (Transportation Economy Research Center).
Kyodai Toshi no Genkai (The Limit of Super Cities), 1974.

Zenkoku Shicho-kai (Japan City Mayor's Assoc.). Nihon Toshinenkan
(Japan Municipal Yearbook), 1975.

Literature:

Ezawa, Joji & Kanako, Keisei, ed. Chiiki Keizai no Keiryō Bunseki
(The Econometric Analysis of the Regional Economy). Tokyo; Keiso
Shobo, 1973.

Ito, Zenichi, ed. Kamitsu Kaso eno Chosen (The Challenge to Over-
and Depopulation). Tokyo: Gakuyo Shobo, 1975.

Kakumoto, Ryohei. Kosoku Jidai no Owari (The End of High-Speed Trans-
portation). Tokyo: Nippon Keizai Shimbun, 1975.

Kotsu Kyoryoku Kai. Kokutetsu Sono Kiseki to Shinro (Japanese National
Railway--Its History and Future). Tokyo: Kotsu Kyoryoku Kai, 1975.

Matsumarai, Shoichi. Zenkoku Shinkansen no Hitsuyosei to Kaihatsu Koka
(The Necessity of Nationwide Network of the Shinkansen and Develop-
ment Effect) Kotsu to Gijutsu (Transportation and Technology, No.
25, Volume 1.

Narita, Jiro. Chiiki Kaihatsu no Riron to Jissai (The Theory and Practice
of Regional Development). Tokyo: Daiichi Hoki Shuppan, 1969.

Sato, Atashi, ed. Chiiki Kaihatsu, Kogai eno Taio (The Countermeasures
for Regional Development and Environmental Disruptions). Tokyo:
Gakuyo Shobo, 1974.

Shimizu, Keihachiro and Hattori, Keijiro. Toshi no Miryoku (The Call of
Cities). Tokyo: Kajima Shuppankai, 1976.

In English:

Non-Governmental Publications:

Japan Center for Area Development Research. The 2nd International
Symposium on Regional Development. Tokyo: 1969.

Japan National Railways International Dept. SHINKANSEN--A Decade of
Progress, 1975.

Literature:

- Blunden, John; Brook, Christopher; Edge, Geoffrey; and Hay, Alan, ed.
Regional Analysis and Development. London: Harper & Row Ltd.,
1973.
- Eldredge, H. Wentworth, ed. World Capitals Toward Guided Urbanization.
New York: Anchor Press/Doubleday, 1975.
- Kornhauser, David, Urban Japan--its Foundations and Growth. New York:
Longman Inc., 1976.
- Kurihara, Kenneth K., The Growth Potential of the Japanese Economy.
Baltimore: The Johns Hopkins Press, 1971.
- Simonis, Heide and Udo Ernst, eds. Japan--Economic and Social Studies
in Development. Hamburg: R. Himmelheber & Co., 1974.

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