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Population and Environmental
Problems in Japan

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Foreword

This is the reprint of the draft of a paper prepared jointly by Minoru TACHI, Institute of Population Problems, and by Saburo KATO, Environment Agency, Prime Minister's Office and presented as a working paper, to the ECAFE Seminar on Ecological Implications of Rural and Urban Population Growth which was organized by the ECAFE and was held at Bangkok on 25 August - 3 September 1971.

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POPULATION AND ENVIRONMENTAL PROBLEMS IN JAPAN

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1. Rural and Urban Population Growth

According to the result of the 1970 population census, the total population of Japan is 103.72 million. Her land area is approximately 370 thousand square kilometers, and the population density is 280 persons per square kilometer. Because of her mountainous land form, her "habitable land area", that is, the land area excluding areas of forestry, waste land, major lakes and marshes is only 112 thousand square kilometers or 30% of the total land area. The greater part of her big population and also that of establishments concentrate here.

The annual average rate of population growth in Japan is moderate in recent years. The 1945 census which was conducted just after the termination of the War showed a total population of 72.2 million, and the 1950 census population was enumerated at 83.2 million. During this

period the annual average rate of population growth was as high as 2.9%. This extraordinary high population growth was due to both an enormous net gain of the repatriates from abroad and "baby boom" after the War, The 1955 census population was 89.3 million, and the annual average rate of population growth for a period from 1950 to 55 dropped to 1.4%, mainly due to a sharp decrease in the birth rate. Since 1955 until the recent census the quinquennial annual average rate of population growth continued to be around 1.0%.

Along with the industrial development, the urban concentration of population has been a lasting trend. After the period of postwar reconstruction, however, the national economy of Japan entered upon a period of rapid economic growth which has been continuing since 1958. This rapid economic growth conspicuously accelerated internal migration from rural to urban regions. The city (shi) population was 37.5% in 1950, 63.5% in 1960, and 72.2% in 1970 of the total population of Japan. Taking medium and big cities with 100 thousand inhabitants or more, the percentage was 25.6% in 1950, 40.5% in 1960, and 51.6% in 1970.

The densely inhabited districts (D.I.D.s) were delineated, for the first time, in the 1960 census, as an attempt to improve the urban-rural classification of population. A D.I.D. is defined as an area within a shi (city), machi (town) or mura (village),

which is a group of contiguous enumeration districts with a population density of about 4,000 inhabitants or more per square kilometer and whose population exceeded 5,000 or more.

In 1960, the population living in the D.I.D.s was 43.7% of the total population, while the area of the D.I.D.s was only 1.0% of the total area of the country. The percentage for population went up to 48.1% in 1965 and 53.5% in 1970, while that for area went up to 1.2% in 1965 and 1.7% in 1970. (See Table 1.)

These figures suggest how remarkable expansion of the existing medium and large cities and other local regions has taken place under the rapid economic growth.

Table 1. Population and Area for Densely Inhabited Districts (D.I.D.s), Japan: 1960, 1965, and 1970

Year	Total	D.I.D.s	(2)/(1)
	(1)	(2)	(3)
	P o p u l a t i o n (1,000s)		
1960	93,419	40,830	43.7%
1965	98,275	47,261	48.1
1970	103,720	55,535	53.5
	A r e a (1,000Km ²)		
1960	369.7	3.9	1.05%
1965	369.8	4.6	1.25
1970	370.1	6.4	1.73

Source: Population census data.

2. Background to Environmental Problems

As mentioned above, the rapid economic growth made a start in 1958, with a rapid development and expansion of industrial activities among which there were found a technological revolution, a switchover of the main source of energy from coal to oil, improvement in structuring of various industries, etc.

Particularly the so-called double income programme initiated in 1960 was aimed at achieving a rapid industrial development on the basis of local development programmes and heavy and chemical industrialization. This was accompanied by a rapid increase in industrial output as well as energy consumption, and along with such vital industrial activities there was an increase in the volume of soot, smoke and effluent water which caused extensive air pollution and water contamination. Especially the shifting of energy source from coal to petroleum products as well as the construction of gigantic petrochemical complexes aggravated the situation.

The heavy concentration of population in urban regions which was promoted by the rapid economic growth, and increased consumption as a result of improved levels of living along with economic development are also key factors affecting environmental pollution problems of today.

In addition to this rapid economic growth and remarkable expansion of the urban population, the geographical and natural conditions of the country are equally important factors responsible for today's environmental problems. As mentioned above, the total area of Japan is small and the majority of its land is mountain and forest. Industries, agriculture and residential facilities for the large population are squeezed into the narrow habitable land. The economic development which advanced so far without sufficient consideration for proper utilization of land commensurate with such geographical and natural conditions is one of the reasons for today's aggravation of environmental problems.

Furthermore, the awakening of the interest and concern about the environmental problems of the general public should be added. People's desire for a healthy and comfortable life and an increasing consciousness of rights has become a strong driving force leading to demand for fundamental solutions to environmental problems.

3. General Situation of Environmental Pollution

The problems of environmental pollution have become one of the most controversial issues in Japan. Especially in the last year, various kinds of pollution problems have occurred throughout Japan. In fact, many problems have

taken place such as water and soil pollution by cadmium, large quantities of bottom deposits in ports and coastal seas near industrial regions, serious water pollution problems caused by the paper and pulp industry wastes, air pollution by lead from auto exhaust gasses in the regions around heavy traffic streets and intersections, and photochemical smog problems in the Tokyo Metropolitan area.

As to air pollution by sulfur oxides (SO_x), one of the major atmospheric pollutants in Japan, it is true that the concentration of SO_x began to decrease in the areas where heavy concentration of SO_x had been found for years, due to the efforts to burn low-sulfur content fuel oil and to the extensive installation of electrostatic precipitators and taller stacks. On the other hand, polluted areas, although they are not so heavily polluted at the moment, have begun to spread outwards, possibly because of the steady increase in fuel oil consumption, new industrial plants located in the suburbs or around the central urban areas, and far reaching smoke from higher stacks.

Thanks to the growing number of dust collecting facilities installed at industrial plants, fallouts of large particulates substantially decreased several years ago. Ever since, they continued, on the whole, to diminish or level off. Lately in some areas, however, there are signs of gradual increase in the

level of these fallouts. Also increasing is the level of fine particulates in the air, particularly in urban centers.

As regards the pollution by carbon monoxide, it is being intensified in areas around heavy traffic intersections in Tokyo, Osaka and other large cities due to the increasing traffic flows in these areas.

Nitrogen oxides are being emitted both from automobiles and stationary industrial sources and the concentration is on the rise in recent years. As nitrogen oxides is not only toxic in itself, but also causes photochemical smog, much attention is now focused on it.

As to water pollution, it is long since the water pollution has affected the human health, water supply sources, fisheries, and so on. Particularly in recent years, the water quality in water courses in Japan has been deteriorating. Under the Water Quality Conservation Law, 71 water basins have been designated to regulate the discharge of effluent from industrial plants, municipal sewage treatment facilities, and so forth. In these water courses, generally speaking, the water quality shows an improving tendency, but there are still many water courses where considerable water pollution can be seen, for instance, BOD values exceeded 10 ppm.

The major causes of the pollution are (1) increase in water consumption accompanied by the rapid industrial growth, (2) concentration of population and industrial plants into several big cities, and (3) considerable shortage of sewerage for urban population and industrial activities.

The characteristics of the current water pollution in Japan are as follows: (1) the rivers running through metropolitan and industrial regions are seriously polluted, (2) the pollution of water has spread into rural regions, (3) heavy metals such as cadmium and chromium are found both in water and bottom deposits, (4) the coastal water pollution has become serious.

In addition to these pollution problems, there occurred problems of intolerable noise by heavy traffic and air crafts, a large volume of solid wastes, particularly those of plastics and other problems.

4. Measures for Environmental Pollution Control

(1) Enactment of the Basic Law for Environmental Pollution Control

To cope with severe environmental pollution problems, the Ministry of Health and Welfare set up the Council on Environmental Pollution as an advisory agency to the Minister in September 1965 which held many discussions on basic counter-

measures to combat environmental pollution, and in October 1966, a report on its findings was submitted. The concept contained in this report played an important role in the establishment of the Basic Law for Environmental Pollution Control of 1967.

It has become clear that not only the direct control of the sources of pollution, but also preventive, planned and comprehensive countermeasures should be taken in order to solve the environmental pollution effectively. For this purpose, it also has become clear that a Basic Law, aiming at carrying out the antipollution measures in a comprehensive and interdisciplinary manner, should be enacted as early as possible, and the public opinion at the time strongly demanded it. Under such circumstances, the Basic Law for Environmental Pollution Control Law (hereafter called "the Basic Law") was enacted in August 1967, and several provisions of the Law were amended in December 1970.

The purpose of the Basic Law is "in view of the vital importance of environmental pollution control for the preservation of a healthy and civilized life for the nation, this Law is enacted for the purpose of identifying the responsibilities of the enterprise, the State and the local government bodies with regard to environmental pollution, thereby ensuring the protection of the people's health and the conservation of

...their living environment."

The Basic Law determines the kind of the environmental pollution which the Law deals with, responsibilities of enterprises, the Government, local governments and citizens, the establishment of environmental quality standards, formulation of environmental pollution control programmes, and other basic ideas and measures for the control of pollution.

After the setting-up of the Law, all features of environmental pollution control activities have been recognized and strengthened. In this sense, the enactment of the Basic Law is of vital importance to the environmental pollution control, and it formed an epoch in the history of antipollution activities in Japan.

(2) Development of Laws relating to Environmental Pollution Control

To carry out countermeasures effectively and strongly, it is essential to establish the Laws which enable the effective enforcement or implementation of these measures. The first Laws which aimed at the control of environmental pollution control were the Water Quality Conservation Law and the Industrial Waste Waters Regulation Law enacted in 1958. As is shown in Table 2, after the enactment of the Basic Law of 1967, a considerable number of Laws have been enacted, and the

environmental pollution control administration of Japan today is based on this legislative structure.

Table 2. Development of Laws Relating Environmental Pollution Control

Year	Month	Laws
1954	April	Public Cleansing Law
1957	June	Water Works Law
1958	April	Sewerage Law
	December	Water Quality Conservation Law
	December	Industrial Waste Waters Regulation Law
1962	May	Law concerning Regulation of Pumping-up of Ground Water for Use in Building
	June	Smoke Control Law
1965	June	Environmental Pollution Control Service Corporation Law
1967	August	Basic Law for Environmental Pollution Control
	August	Law concerning Control of Marine Pollution caused by Oil from Vessels
	August	Law concerning Prevention, etc. of Disturbance caused by Aircraft Noise in the Vicinity of Public Aerodromes
1968	June	Air Pollution Control Law
	June	Noise Regulation Law

Year	Month	Laws
1969	December	Special Law concerning the Relief for the Patients related to Environmental Pollution
1970	June	Law concerning the Settlement of Environmental Pollution Disputes
	December	Law for the Punishment of Environmental Pollution Crimes relating to Human Health
	December	Law concerning Entrepreneur's Bearing of the Cost of Public Control Works
	December	Water Pollution Control Law (Water Quality Conservation Law and Industrial Waste Waters Regulation Law were abolished.)
1970	December	Marine Pollution Prevention Law (Law concerning Control of Marine Pollution caused by Oil from Vessels was abolished.)
	December	Waste Disposal and Public Cleansing Law (Public Cleansing Law was abolished.)
	December	Agricultural Land Soil Pollution Prevention, etc. Law
1971	April	Law concerning Special Government Financial Measures for Pollution Control Projects
	May	Law on the Establishment of Organization for Pollution Control in Specified Factories
	May	Offensive Odours Control Law

(3) Establishment of Environmental Quality Standards

Even prior to the enactment of the Basic Law, there were emission or effluent standards based on the Water Quality Conservation Law and the Smoke Control Law, but no environmental quality standards. Therefore, there existed difficulties in solving effectively the cumulative concentrations of pollutants in the environment, and there were no clearly fixed target of pollution control activities. At present, the standards are established under Article 9 of the Basic Law. This article provides as follows:

"1. With regard to environmental conditions relating to air, water and soil pollution and noise, the Government shall establish environmental quality standards, the maintenance of which is desirable for the protection of human health and the conservation of the living environment.

2. In the event that one of the standards referred to in the preceding paragraph establishes more than one category and stipulates that land areas or areas of water to which those categories are to be applied should be designated, the Government may delegate to the prefectural governors concerned the authority to designate those land areas or areas of water.

3. With regard to the standards provided for in paragraph 1, due scientific consideration shall always be given and such standards shall be revised whenever necessary.

4. The Government shall make efforts to ensure the maintenance of the above-mentioned standards, by implementing environmental pollution control measures in a comprehensive, effective and appropriate manner."

Based on this provision, the Government set up air quality standards for sulphur oxides in February 1969, and for carbon monoxide in February 1970, water quality standards in April and May 1970, and noise level in May 1971.

Since these environmental quality standards are functioning as the guideline for administration, the Government and other organizations concerned have the responsibility of making their very best to ensure the standards.

(4) Formulation of Environmental Pollution Control Programmes

Based on the Basic Law, comprehensive Environmental Pollution Control Programmes are to be formulated and implemented in such areas as: (1) those where present environmental pollution levels are high and the situation will be difficult to control unless comprehensive control measures are taken,

and (2) those areas where it is to be feared that environmental pollution may become serious.

In the formulation of the Environmental Pollution Control Programmes, the Prime Minister is to designate the areas to which the programmes are to be applied to make clear the fundamental policy with regard to such programmes, and to instruct the Prefectural Governors to formulate such programmes: the Governors are then to formulate their programmes and submit them to the Prime Minister for his approval.

The fundamental policy for the Environmental Pollution Control Programmes includes the extent of the areas to be covered by the programmes, the role of Control Programmes in those areas, the targets to be achieved, the concrete counter-measures and so forth.

Already, the Prime Minister designated the three districts of Chiba--Ichihara in Chiba Prefecture, Yokkaichi in Mie Prefecture, and Mizushima in Okayama Prefecture, as the first group of target areas. The programmes for these three areas were approved on 1 December 1970 and are currently being implemented. The Tokyo, Osaka and Kanagawa areas were also designated as the second group, and issued directives indicating basic policy on 25 May 1971. The local governors concerned are currently working out their programmes.

These programmes will include at least the following items: (A) construction or reconstruction of public drainage and treatment system for industrial wastes, including sewage treatment facilities, (B) construction of green belts, (C) construction of waste disposal facilities, (D) movement of schools or improvement of their facilities, (E) dredging of rivers or harbours, (F) rehabilitation of agricultural lands that have been polluted by chemicals, and (G) setting up of monitoring or measuring systems.

(5) Environmental Pollution Control at Local Level

Environmental pollution control administration of Japan was initiated by local governments (prefectural and municipal governments), because it was closely connected with local problems affecting the living environment of the areas. The governments of Prefectures and big cities which had large scale industrial areas set local Ordinances for the environmental pollution control. For instance, the Tokyo Metropolitan Government set the Ordinance regulating the environmental pollution from factories in 1949, and the Osaka and Kanagawa Prefectural Governments also set Ordinances in 1950 and 1951 respectively.

Since 1954, the Government began to set laws with a view to create sanitary conditions in Japan, and several laws in this field were established (see Table 2).

Thus both central and local governments began to deal with environmental pollution and this tendency was strengthened by the enactment of the Basic Law. Article 5 of the Law provides the responsibility of local governments as follows: "in order to protect the health of the local population and to conserve the living environment, local government bodies shall take measures in line with the policy of the State and shall also work out and implement appropriate measures for environmental pollution control which take into account the specific natural and social conditions of the area concerned."

According to Article 23 of the Basic Law, the Government should make endeavor to take necessary financial and other measures relating to the necessary expenses of environmental pollution control measures implemented by the local governments.

Encouraged by these provisions and public opinion, as of the end of March 1971, all prefectural governments and a number of big municipalities came to have their own Ordinances and special offices and staffs to cope with the environmental pollution problems of the areas concerned. As of July 15, 1970, there was a staff of 3,046 working for environmental pollution control, of which 1,300 were working for prefectural governments and 1,746 for municipalities. Throughout Japan,

there were 4,075 fixed or designated monitoring stations run by local governments, of which 2,674 were for water pollution, 1,203 for air pollution, and 198 for noise and vibration. The 1970 fiscal year budget for the environmental pollution control by all local governments was 32 billion yen, of which 20.8 billion yen for prefectural governments and 11.2 billion yen for municipalities.

(6) Promotion of Research and Development

In order to prevent environmental pollution, it is of vital importance to promote research and development not only of control technology aimed simply at preventing damage, but also of basic research and technology conceived in a broader perspective of preserving the human environment.

To accomplish such research, efforts have been made at a number of institutions--national research institutes, institutions belonging to local governments, and various departments and research institutes of universities and colleges.

5. Establishment of the Environment Agency

The administrative authorities for the control of environmental pollution used to be distributed among a number of Government agencies, so that it was feared that their responsibilities would be ambiguous, often resulting in the lack of

consistency among the measures pursued by individual agencies. These circumstances lent support to the growing body of opinion for integrating the administration of environmental pollution control.

With a view, therefore, to integrating and unifying the administrative authorities for the control of environmental pollution into a single command with clear-cut responsibilities, it was decided to establish the Environment Agency within the Prime Minister's Office.

The basic approach underlying the establishment of the Environment Agency is summarized as follows:

Firstly, the administrative responsibilities of the Environment Agency will not be confined merely to the control of environmental pollution, but will deal with all problems relating to the conservation of environment, including the protection of natural environment.

Secondly, the administrative responsibilities such as the establishment of various regulation standards, surveillance, monitoring and policing, that had been distributed among government agencies will be integrated into the hand of the Environment Agency, thereby completing the unification of the environmental pollution control administration.

On July 1, 1971, the Environment Agency was established based on the Environment Agency Establishment Law which was enacted in May 1971. The number of staff working for the new Agency is 501, and the budget for 1971 fiscal year is about 3,865 million yen. The organization of the Agency is shown in the following chart.





