

## Chapter 1

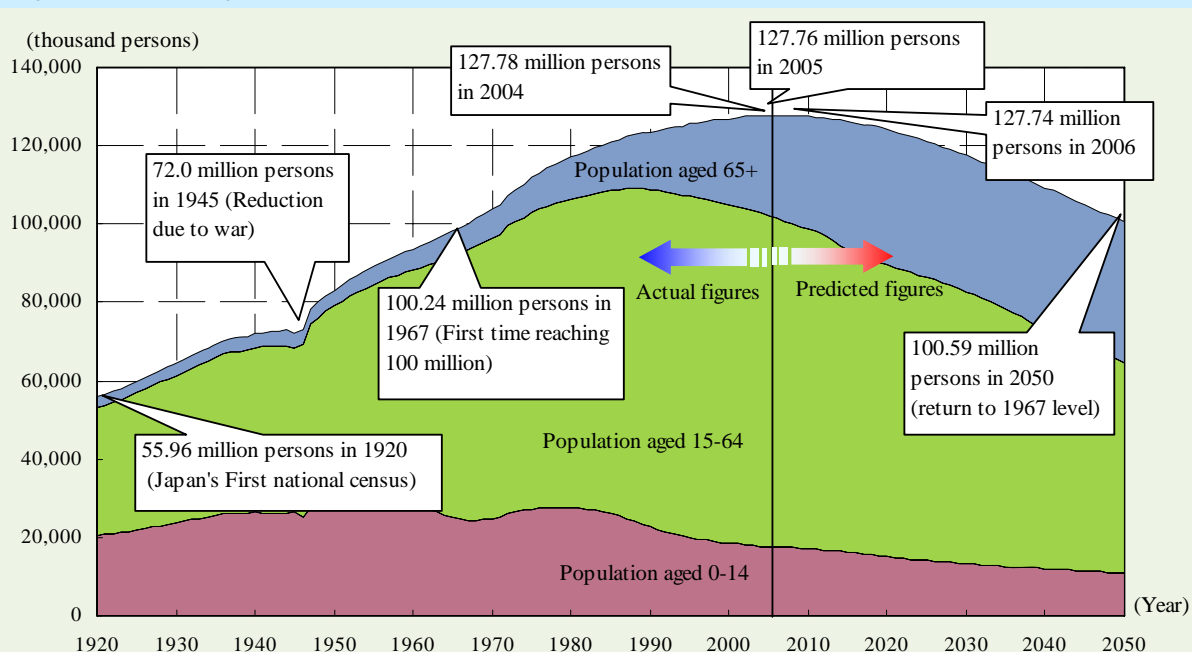
# Current Status of an Aging Society with Fewer Children and Challenges for Science and Technology

## Section 1 ■ Current Status and Predictions for an Aging Society with Fewer Children

### ● Start of a society with a declining population

In 2005 the total population of Japan dropped below the level of the previous year for the first time since World War II. This start of a population decline is two years sooner than the 2007 date predicted in the National Institute of Population and Social Security Research January 2002 projections (intermediate forecast) (Figure 1).

Figure 1 ► Changes in the population structure in Japan



Note: Between 1941 and 1943 the breakdown of the population into the three age groups was supplemented from the values for 1940 and 1944. The data from 1946 through 1971 does not include Okinawa. In the total numbers for the Population Census the people for whom age was not known were distributed proportionally among the age groups.

Source: Through 2005, numbers are taken from the Ministry of Internal Affairs and Communications, Statistics Bureau "Population Census," "October 1 Population Estimates." For 2006 and after, values are based on the National Institute of Population and Social Security Research, "Population Projections for Japan (January 2002 Projections)" and the Cabinet Office "White Paper on Birthrate-Declining Society 2004" (December 2004).

### ● Progress of aging society and decrease in the number of children

Looking at the number of births, there has been a decreasing trend since Japan's second baby boom in 1974. The total fertility rate reached an all-time low of 1.29 in 2004, and the decrease in the number of children is progressing more noticeably than in Europe and the USA.

The percentage of the population aged 65 years or over surpassed 14%, the level regarded to constitute an "elderly society," in 1994. In October 2004 the rate reached 19.5%, with Japan's proportion of elderly people surpassing that of other developed nations. It is projected that the aging of society in Japan will continue at a rapid pace that exceeds that of other countries.

### ● Population projections for Japan and the world

According to the United Nations projections in 2004 the total world population is expected to continue to increase, although the rate of increase will decline. In major developed nations it is predicted that the populations will begin to decrease, in the 2010s for Italy and Germany, and in the 2040s for France. Furthermore, in Asia it is projected that South Korea will experience a population decline that is even quicker than that in Japan, while China in the 2030s and Thailand in the 2040s are expected to start facing population declines. Japan is facing this situation earlier than these other countries and is now confronting the problems of a declining population and an aging society with fewer children.

## Section 2 ■ Issues to be Addressed by Japan and the Role of Science and Technology

### 1 Effects of the progression of aging society with fewer children

#### ● Impact on society

The percentage of the elderly population is increasing, and the number of working-age people for every elderly person will drop to 1.5 by 2050, raising concerns about the increasing burden of social security from pensions as well as health care and nursing care.. In addition, it is expected that the working population will continue to decrease in the future. It is projected that in 2007 the baby boomer generation will start to retire from the labor market as they approach the age of 60. Looking at the society of the country in terms of the population structure, it is predicted that there will be a complete change from the structure of the past.

#### ● Impact on science and technology

There is fear that changes in the composition of the population could have a large impact on the ability to secure the personnel that support a science and technology-based nation. The percentage of middle-aged and elderly people working in specialized/technical jobs is increasing. In addition, the Year 2007 Problem is expected to have a large impact on shortage of engineers and skilled workers, particularly in the fields of science and technology, and on the passing on of techniques and skills.

Even though it is crucial to ensure that the younger generation with vitality and creativity enter the fields of science and technology in order to strengthen and maintain the science and technology abilities of Japan, if there continues to be a decline in the interest of the younger generation in science and technology as the decrease in the number of children progresses, there

are concerns about the predicted both the quality and the quantity of science and technology personnel will be inadequate.

## 2 Dealing with aging society with fewer children and the role of science and technology

### ● Measures to change the trend of fewer children

A major factor of the population decline and aging society with fewer children is the decline in the birth rate that has continued over a long period.

The government established “National Youth Development Policy” in June 2004, aiming to make a transformation to a society in which children can be raised healthily and in which it is possible to bear and raise children joyfully, in order to “reverse the trend of fewer children.” In December that same year a “Support Plan for Children and Childrearing” was established as a concrete plan of action incorporating the measures described in the general policies. Focused measures are now underway, and it is important for the entire society to make continued efforts in the future.

### ● Building new social systems

Even if the trend of fewer children is changed and the birth rate begins to increase, Japan cannot avoid a decline in population in the short term.

Japan must maintain the vitality of society, achieve a society that offers an abundant life and provide a stable future in the midst of a decrease in the labor force accompanying the declining population and aging society with fewer children, as well as the decrease in the population of children and young people. On the other hand, the global-scale issues, such as environmental problems, food supply problems, resource and energy problems, require a shift from our mass-production, mass-consumption, mass-waste civilization of the 20<sup>th</sup> century.

As a nation with few natural resources and little land, wealth has been achieved through a high level of education and the high level technical abilities of the human resources. In the future, as international competition becomes even more intense, it is necessary to continue to maintain international competitiveness and provide high value-added products and services to the world, while corresponding to the changes in the population composition, maintaining and improving the quality of life of citizens and achieving an abundance that includes spiritual and mental aspects. There is also a demand to actively contribute to global scale problems such as the environmental problems, and it is believed that the role of science and technology will continue to grow.

The foundation that supports the progress of science and technology more than anything else is the ability of the people who are engaged in science and technology. As population decline and the aging society with fewer children progresses, the measures to ensure the quality and quantity of science and technology personnel must be promoted even more strongly in the future. It is also necessary to foster the understanding, interest, empathy and confidence of the public towards science and technology.

In a situation of a decreasing population and an aging society with fewer children, development of “Human Resources” and achievement of a “Science and Technology-based Nation” have become even more important and significant as the path that must be followed by Japan.

By approaching the handling of a declining population and an aging society with fewer children as a challenging opportunity to build the future society and being the first in the world to

resolve the issues, if Japan can realize new social systems to deal with population decreases and aging society with fewer children and show the world an abundant, sustainable society, this becomes an opportunity to present a model to other countries that will face the same issues in the future.

In addition, an abundant and stable society is connected to the realization of a society in which people have hopes for the future and the desire to raise children, so this is likely to contribute to reversing the trend of fewer children as well.

### ● Science and technology to deal with changes in the population composition

In a society with a declining the working population, it is necessary to achieve a society in which it is easy for women and the elderly to work, to increase the rate of participation of these groups in the labor force, which has conventionally been low, and to increase the abilities of each individual, in order to ensure the necessary quantity and quality of the work force.

Progress is being made on maintaining health throughout one's life, through the prevention, diagnosis and development of treatments based on a new understanding of various diseases, and on the development of robotic technology to reduce the burden of nursing care and assist in the independence of the elderly.

In addition, by realizing a society that allows a choice of a variety of work styles, more people will be able to participate in society with enthusiasm while maintaining a balance between work and family life. There are expectations for the development of an environment in which it is easy to work using IT (information technology) and robot technology, as well as improved efficiency for housework using a variety of home electric and electronic products, and securing of the opportunities to study and develop job skills throughout one's life through the use of IT.

Furthermore, in the midst of intensifying international competition for human resources there is a need to develop the research environments and recruiting systems that make it possible to attract a large number of talented personnel to come and be active in the research community in Japan, without regard to nationality.

On the other hand, in order to raise each child to be healthy and able to participate independently in society, research on pediatric care is continuing, and results from brain science research are expected to contribute to solving questions related to learning and achievement in children.

With regard to social capital, technology development aims to adopt universal designs for the purpose of encouraging the participation of the elderly in society and making things easy to use even when bringing up children, as well as reducing the maintenance and management burden.

Science and technology is also expected to provide answers to the needs of society and resolve social problems, including tackling global environmental issues and building a safe and secure society.

### ● Science and technology to vitalize the economy

As population decline and the aging of society with fewer children progresses there is a need to continue to increase productivity in order to maintain economic vitality and achieve stable economic growth. In addition, international competition is expected to become even more intense in the future. Under these circumstances, it is crucial for there to be internationally-competitive businesses to drive Japan's economy. Science and technology will play a central role in improving productivity and strengthening competitiveness, and it is necessary to further promote science and technology. It is important to strive to achieve sustainable economic development through the

development of social systems that closely link the results of science and technology with innovation.

### ● **Science and technology to contribute to the building of a spiritually wealthy society**

During the long life of the people due to the increase in the average lifespan, it has become possible for each individual to enjoy wealthy life actively participating not only in work, but also in hobbies, learning and local activities.

There is a need for science and technology to contribute to not only material wealth, but also to achieving spiritual wealth. For example, there are media arts, technologies for the preservation, restoration and utilization of the cultural heritage, and the distribution of information on cultural assets through digital archives.

Furthermore, basic research conducted based on free imagination satisfies intellectual curiosity and leads to new knowledge for humanity.

### ● **Science and technology for people and the supporting personnel**

In recent years the interest of the public in science and technology, particularly among the young, has been tending to drop. In order for science and technology to contribute to resolving the social issues as expected by people, it is necessary for people to have an interest and understanding of science and technology. Therefore, for the promotion of science and technology there is a need to promote the empathy and confidence of citizens from the viewpoint of science and technology for society, and science and technology partnering with the people. To achieve this it is necessary to make efforts to foster a broad understanding of and interest in science and technology among citizens, from children to adults.

The foundation of science and technology development, more than anything, is the people. As society continues to age and the number of children declines, there is a need to prepare an environment that allows a wide variety of people to actively participate in society, while securing and improving the quality of the personnel working in science and technology. For this reason, there must be comprehensive measures to develop the required human resources. In addition, it is necessary to ensure a supply of talented personnel even in the midst of intense international competition for workers, by developing an environment that allows a wide variety of people to actively participate, including the young, women and the elderly, and by building a research environment that is attractive to talented researchers from abroad, as well as the acceptance systems, including support for daily life.

In Chapter 2 there is a section with detailed explanations for each of the items above regarding the role of science and technology for the development of a new society.