Population Decline in Japan and Sustainability

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ABSTRACT

Impact assessment of population changes is critically important as we are living in a population decreasing society. People is the key element in our society and sustainable development is supported by people. Thus, we focus on people in this study and analyze potential population changes across different sectors over the next 25 years in Ichihara city, Chiba prefecture, Japan. Our estimated results indicate that working-age population will continue to decrease in most sectors over the next 25 years. Such results imply labor shortage problems. It has been noticed that available workers in the agriculture sector, construction sector and the manufacturing sector over the next 25 years will continue to decrease. Labor demand in the elderly care sector and the welfare sector are estimated to increase, emphasizing the importance of immigration policies to tackle labor shortage problems in Japan.

Keywords: Impact assessment, population, Japan, labor shortage, immigration policies, large shortage problems.

INTRODUCTION

Impact assessment of population changes is critically important as we are living in a population decreasing society. People-centered concept has been the key for understanding sustainable development (UNDP 2011). People is the basic block in our society and sustainable development is often supported by people. Thus, we focus on people in Japan in this study and analyze potential population changes across different sectors over the next 25 years. Funded by Japan Science and Technology Agency, Research Institute of Science and Technology for Society (RISTEX), this research belongs to a research project entitled “Open Project of Stock Sustainability Management:

OPoSSuM". Estimation results of this study could provide the government important information such as whether or not the future labor force in Japan will meet the social demand. Given the backdrop that Ichihara city (Chiba prefecture, Japan) is the second largest city in Japan in terms of its value of shipments of manufactured goods, we focus on this representative city for the future analysis (See Figure 1).

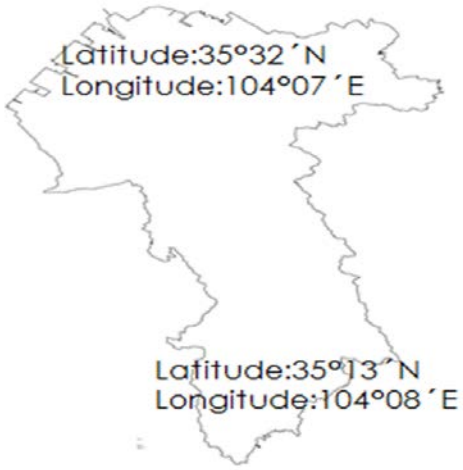

Figure 1. Geographic range of Ichihara city (the map is acquired from Geospatial Information Authority of Japan) (Geospatial Information Authority of Japan 2015)

METHODOLOGY

In this study, we use a cohort model to estimate future population changes across different sectors, including agriculture, manufacturing, construction, welfare and the medical care sectors. Working-age population in different sectors at each 5-year cohort at the base year t and the next-up cohort at year t + 5 is used to predict the future population. In the model, we assume the net migration rate is unchanged over our analysis period.

RESULTS AND DISCUSSION

Total population in Japan reached its peak (128,080,000) already in 2008 and started to decline since then (Ministry of Health, Labour and Welfare

2015). It has been estimated that the total population in Japan will drop to around 100,000,000 in 2050 (National Institute of Population and Social Security Research 2012). Our estimated outcomes indicate that the available workers in Ichihara city will decrease in most sectors over the next twenty-five years, corresponding to the national population change trend. In addition to the total population decline, working-age population is estimated to decrease more in 2040 than 2015. Elderly people aged 65 and over is estimated to increase over the next 25 years. An inverted population pyramid in the future emphasizes the harsh reality of population issues to the nation such as potential labor shortage problems and fiscal burden to the government.

Population decline and ageing can have significant impacts on different sectors. In the primary sector like agriculture, labor shortage problems could affect the agricultural production. In Japan, the current food self-sufficiency ratio is around 39%, and most foods must be imported from other countries. Despite the fact that Ichihara city had the largest farm household in Chiba prefecture in 2005, its agricultural production only met approximately 23% of local food demand. In general, average salary in the agricultural sector is lower than other sectors. A further decline in working-age population over the next 25 years could affect agricultural production further and lower self-sufficiency ratio. Lower incentives, along with labor shortage problems and ageing, could add more pressure to the sector. Based on our cohort analysis, agricultural population in Ichihara city in 2040 is estimated to decline (40% of 2015 population size). If Ichihara city in 2040 still wants its land area to be cultivated, its average cultivated land area per person in 2040 needs to be 2.5 times more than 2015. At any time, food security is an important topic to a country. Ensuring a stable food supply has significant implications in the context of food security and sustainable development.

It has been estimated that the working-age population in the manufacturing sector in Ichihara city will also decrease in 2040 and becomes 72.8% of that in 2015. Considering the fact that the manufacturing sector is a key sector in supporting economic development of Japan, effective labor policy in collaboration with immigration policy might play crucial roles in mitigating the potential labor supply shortage issues.

The estimated results also indicate that the working-age population in the construction sector in Ichihara city will decrease further by 2040 (41.8% of 2015 population size). Correspondingly, residential demand in Ichihara city will also decrease over the next 25 years. Though the city belongs to the metropolitan area, direct and indirect impacts of population decline could be significant.

An ageing society provides more business chances and job offers in the medical sector and the elderly care sector. Demand in these two sectors in the Ichihara city is estimated to increase 10.3% by 2040. Although business chances sound good, labor shortage problems are significant issues. The estimated results showed that the rate of people who needs daily life assistances in the city was 37.1% in 2011, slightly lower than the average rate of the national level (35.9%). As the elderly people increase, more facilities need to be established to offer care services. Currently, facilities that could take care of people who are certified nursing care level 3 or above by the government is already not enough in the Ichihara city. A further increase in demand (people who are certified nursing care level 3 or above by the government will become 15 times more by 2040) in the future would easily goes beyond the capacity of the city. More working-age people and money will be the key to meet an increasing demand.

It has been found that the number of hospitalized patients has decreased gradually over time along with technology progress of medical treatment. On the other hand, the number of outpatients has increased over time. Such phenomena can be observed at the national level. Although population decline would reduce the number of patients going to the hospitals, an increased number of elderly people could increase both the hospitalized rates and the outpatient medical treatment rates. Such phenomena may make hospital beds not enough in the future. Based on our estimation, it has been found that one person in four may not be hospitalized around 2030 due to shortage of beds.

CONCLUSION

All in all, impact assessment of population changes is critically important. In this study, we used a cohort model to assess population changes over the

next 25 years. It is estimated that the working-age population in the agriculture, construction and the manufacturing sectors will continue to decline. As a result of population ageing, labor demand in the elderly care sector and the welfare sector will increase. Assessment results of this study indicate ageing issues are negative to sustainable development. The estimated outcomes also emphasize the importance of effective immigration policies to tackle labor shortage problems in Japan. Although some people might oppose immigration reform, welcoming more immigrants that meet specific qualifications such as having more than 10 years' experiences in a labor shortage sector could be a possible strategy to tackle labor issues in Japan. In doing so, the minimum number of laborers required by each sector could be guaranteed.

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