A Selection Method for the Locations of Welfare Facilities for the Aged People

Sung Jin Hong, In Sun Jung, Jong-Hwa Na, and Wan-Sup Cho

Abstract—Following Population structure Report by UN, it is no more surprise that we will face aged society crossing aging society quickly. Policy about welfare especially for aged people is getting popular and hot issued these days. Existing research shows facilities for elderly people was cared only quantity and it caused decreased service satisfaction. However, we have to consider about the quality such as service, and facilities location. In other words, the facilities need to care about accessibility for aged person. Therefore, this study focuses where is better location for welfare facilities which is based on popularity and walking distance of aged people.

Keywords—Public facilities, public transportation, demographic aging, amenities for elderly population

I. INTRODUCTION

Due to the lowering of the birth rate and the development of medical technology, we get more and more accustomed to the increase of the aged people.

According to the report of 2013 by National Statistical Office, the aged people 65 years old or older account for 12.2% of the total population in Korea, while the ratio of the aged families is 19.5% and tends to increase every year. These numbers point to an aged society, based on the UN population patterns and the social phases.

According to the survey result of 2013 by National Statistical Office, the welfare service the aged people want to receive was found to be that adhered to life. Life-adhered service means nursing, bathing, meal-serving, companionship to talk to, etc., which are individually provided only by limited agencies, while in most cases, senior care centers or senior welfare centers take over these responsibilities. Thus most aged people should personally make movements to the welfare facilities, so the locations of the welfare facilities and the transportation means are important. But current transportation means are those in which only the simple population distributions are taken into consideration. Therefore, in this study, we are going to suggest convenience services (locations of facilities) for the aged people, considering the distribution of the aged population and the locations of the facilities the aged people can mostly use, based on the integrated Cheongju City. Moreover, for the suggestion, we used not only demographic data, but also we applied geomatic information of facilities which published on their website. In this study, we used GIS (Geographic Information System) tool for integrating and converting the data, so we could analyze the data based on real geographical environment.

The composition of the thesis is as follows: We describe on the related studies in Chapter 2, and analyze the information on the distribution of the aged people and the locations of the facilities in Cheongju City. After describing the analysis method for the convenience services for the aged people and the method to approach the public transportation services put in service in Chapter 4, we give the conclusion and future study tasks in Chapter 5.
their sixties or older.

For this study, we also used big data approach which means combining various data. We gathered information which we can find on the website and applied geographical information as well with classical data analysis. We tried to make the best use of whole integrated information, so analysis could extract best insight for aged people.

Basically, we used published data in National Statistical Office and Cheongu city government. The data also came from on website which includes address or facilities information. For data preprocessing, we integrated and extracted demographic data first and then we analyzed the data on the map of Cheongju city with other facilities’ data which extracted from websites.

In this study, X-ray map offered by BIZGIS.com was used for extracting and analyzing the geographical information.

A. Aged People in Chongju City

Checking the population density of Cheongju City regardless of the age will let you confirm the high density at the center (downtown of the city) of Cheongju City. Accordingly, the density of the aged population is also high at the center of the city. The population itself in the part which was previously Cheongwon County is less than that in the part which was previously Cheongju City, while lower population density is seen in accordance with the local characteristics (unurbanized districts). So, for accuracy of the study, we checked the density of the aged population 60 year of age or older by dividing the city into the previously Cheongwon county part and the previously Cheongju City part. The result shows high aged population density not only at the center of the previously Cheongju City but at major towns of the previously Cheongwon county.

Following those methods which are separated by local characteristic avoid the bias of facilities convergence which happens when only considered absolute population. It could also contribute balanced development between regions.

B. Welfare Facilities for Aged People in Cheongju City

For the facilities for aged people, we classified health centers, health center branches, health care centers, senior welfare centers, elderly care congregate household, elderly care facilities, elderly residential facilities, elderly home care facilities, etc. as welfare facilities for aged people and carried out the check. As there are more seniors who use health centers, health center branches and health care centers than young people, we classified those facilities as welfare facilities for aged people. The welfare facilities for aged people are concentrated at the center of the previously Cheongju City, and distributed in the shape of a doughnut in the previously Cheongwon county. The result shows there is blind area between previously Chenongju and Cheongwon border.

IV. LOCATIONS OF ELDERLY WELFARE FACILITIES CONSIDERING THE ACCESS ON FOOT

The on-foot accessibility onto the welfare facilities by aged people means determining the locations of the facilities based on the existence of the welfare facilities within a proper distance using the aged population density and the distance in which a senior can access a facility on foot. Concerning the distance from the dwelling placed to the welfare facilities, users of the facilities within 1000m were found to be the most at 64.5% (Kim Jong-hwan, 2011).

In Figure 1 which made by X-ray map from Biz-gis.com, in order to see the aged population density and the locations of the welfare facility, we checked the locations of the welfare facilities and the aged population density at the same time. In Figure 1, the red spots stand for the locations of the health centers, the blue ones the locations of the health care centers and the health center branches, and the yellow ones the locations of the senior welfare centers, the elderly care congregate household, the elderly care facilities, the elderly residential facilities and the elderly home care facilities.

As can be seen from the figure, there are areas in between where there are no facilities for the aged, with significant population distribution. Particularly, when judging based on the criteria of radius of 1,000 meter form facilities, we could confirm that there are many areas, highly populous with aged people, which are not covered by welfare facilities such as Naesu-eup, Nam-n-myeon, and Ochang-eup. Based on the result, we should consider the area instead of other area when new facilities are planned to install.

V. CONCLUSION AND HENCEFORTH TASKS

In this study, we studied how we can select the locations of welfare facilities for aged people, considering the need for the increased welfare facilities for the aged people in accordance with the increasing aged population, and the aged population density and the walking distance of aged people, in selecting the locations of the facilities. The welfare facilities for aged people will loom to us as more important problem, as we shift from an aging society to an aged one. And the problem cannot be simplified, as it is not simply a problem of locations, but is
interlocked with the problems of the local and welfare equity.

When you add welfare facilities for aged people, you should consider demographic situations and the selection of the locations should be made in consideration of the accessibility of the aged people. Although we discussed only on the walking accessibility of the aged people in this study, the accessibility through the public transportation means should be taken into consideration, in addition to the walking distance, in future studies, while the socio-economic situations should be taken into account in addition to the aged population density. Moreover, different radii of influence should be considered for different welfare facilities for aged people. That is, studies are needed in which the influence radii (attracting people) are distinguished between large facilities, such as health centers and large senior care centers, and small welfare facilities, such as senior community centers, with weighted values reflected on them.

Finally, as you can see in this study, data fusion between difference fields is getting popular and it makes great synergy. The conversion of various data such as demographic, geographic, traffic, and classic statistical data could provide and help more effective insights and welfare policy, so it needs more invigoration.

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