

Cadastral (re)survey and human resource supply in Japan

Masaru KAIIDZU, Japan

Key words: Vocational School, Licensed Surveyor, Population

SUMMARY

Japanese Government is promoting re surveying 150 years old Cadaster by partly bearing cost of municipalities. The survey is carried out already 72 years but still in the way. Steady supply of budget attracts relatively small survey companies located in and around the municipalities which carry out Cadastral Survey. Cadastral Survey provide stable source of income for those companies. On the other hand, many of survey companies suffer from shortage of supply of human resource. To meet demand of surveyors' lifelong education, Japan Surveyors Association provides "Continuing Professional Development" program. Japan Land Survey Association (association of survey companies working for Cadastral Survey) join this program and carrying out examinations focused on cadastral survey to give incentive for surveyors catching up new technology and new regulations. Surveyor Education Center foundation which is an association of vocational school providing vocational training for surveying is working for sustainability of important source of young surveyors, Vocational schools. Those schools are also facing problem of decrease of students. Most important thing is that young people understand surveying is attractive profession.

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1. Introduction

Just after the Meiji revolution when Japan started modernization of social structure, Japanese government changed Taxation from in-kind payment to money payment. On that occasion, privately owned lands are surveyed and registered. The survey technologies employed in the survey were old days technologies and precision was not enough especially in rural area in terms of modern standard. In 1951, National Land Survey Act was enforced and Japanese government started re survey with modern technologies. To promote the project, Government bear half of cost and a quarter of total cost is born by prefecture. Thus, municipalities can carry on the survey with only preparing one quarter of total cost.

Survey for registration of description of land and building is carried out by Land and Building Investigators. Project and administrative survey are carried out by Licensed Surveyors. Cadastral Survey is carried out by municipalities and contracted out to survey companies. In this paper, we will concentrate on survey companies.

2. Survey companies

As is stated, Systematic cadastral survey according to National Land Survey Act is carried out by survey companies. According to Survey Act, survey companies must be registered to Ministry of Land, Infrastructure Transport and Tourism. Survey companies carry out project survey, survey for maintenance of infrastructure, mapping, and assisting fundamental survey and cadastral survey. Fundamental survey or very precise survey will be contracted to companies which have specific skill or large companies which employ highly qualified surveyors and expensive apparatus. Cadastral survey will be contracted mostly to local companies, having very good knowledge and experience on local communities. Those companies involved in cadastral survey form Japan Land Survey Association (JLSA).

Figure 1 shows number of registered survey companies. It peaked out in year 2003, and slowly decreasing. It may be due to decrease of national budget for public works in end of 90's till 2011. After 2011, number of survey companies is still decreasing but the rate is smaller.

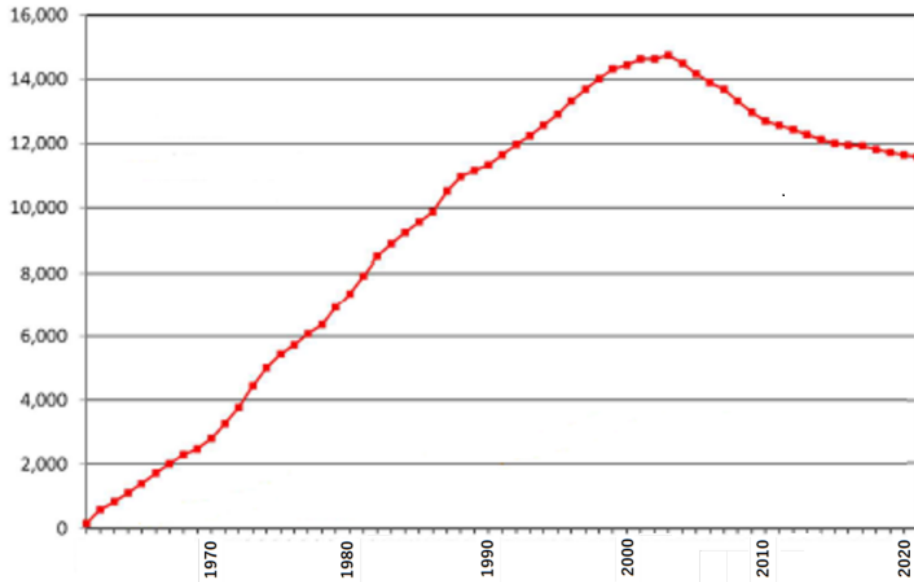


Figure 1 Number of registered survey companies
 Survey of registration of construction industry (Ministry of Land Infrastructure Transport and Tourism,2022)

On the other hand, number of member companies of JLSA increased rapidly from year 2000 till 2006 and keeping the level (Figure2).

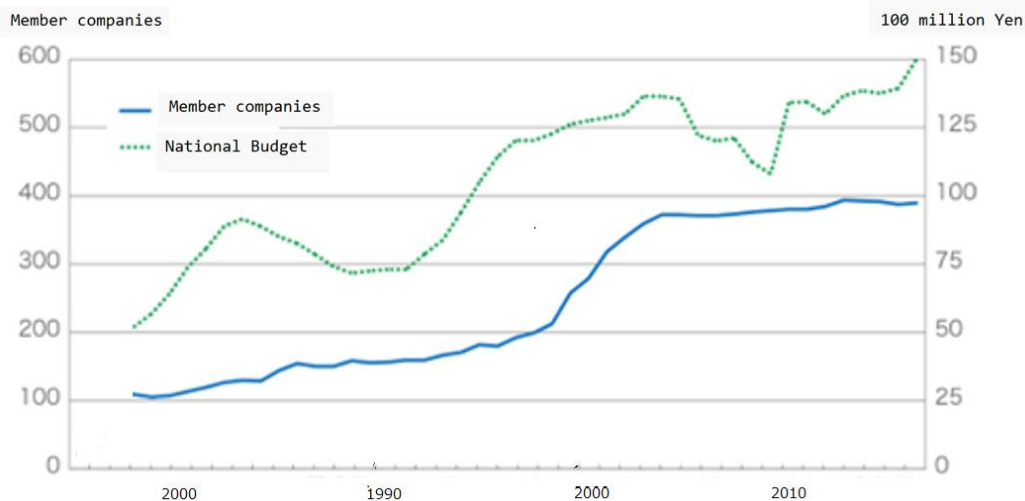


Figure 2 National budget for Cadastral survey and Number of JLSA members

The same figure shows National budget for cadastral survey increased about 10 year prior to increase of member companies. It suggests that increase and steady supply of budget sustainably support local survey companies and attract those companies to join cadastral survey.

Although the budget is steadily prepared, survey companies often face problems of insufficient supply of technical staffs.

3. Shortage of Surveyors

According to a survey by Geospatial Information Authority in year 2018 (Geospatial Information Authority, 2018), 23.4% of survey companies face shortage of both licensed surveyors and licensed assistant surveyors. 20.9% face shortage of licensed surveyors and 2.9% face shortage of licensed assistant surveyors. For those who have surveyor's license, job market is in favor to job seekers. According to the same survey, survey companies recruit necessary technical staff mainly from experienced people. It gives incentive for assistant surveyors to get surveyor's license (Figures 4 and 5)

To get a license of surveyor or assistant surveyor, there are 3 main ways. First is take Survey course in universities prepared for civil engineering, Agricultural engineering, Forestry, Mining, Astronomy, Geophysics, Physics, Geography or Geology course and successfully graduate. Then they are given license for assistant Surveyor. Then they can get Surveyor's license after experience. Second way is to finish Survey course in vocational school which is registered by Minister of Land Infrastructure Transport and tourism. Then procedure is almost same other than experience should be twice as long as for university graduates. Third way is to pass examination by GSI, the government authority. When they passed the examination for surveyor, they are licensed as they request. One can start from examination for assistant surveyor's license. In this case, to upgrade their license to surveyor, they must take examination for surveyor.

Two of Vocational schools have special course registered by minister of MLIT. It is intensive course for those who have assistant surveyor's license. They can acquire license for surveyor in one year.

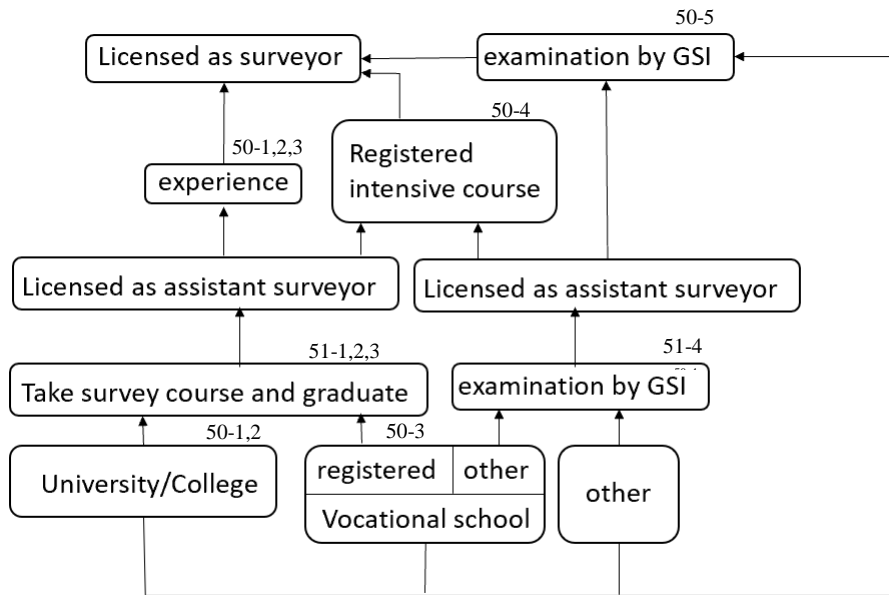


Figure 3. Way to be licensed as surveyor or assistant surveyor
Simplified diagram based on Survey Act. Numbers shown on the shoulder of boxes corresponds to related Article and section of Survey Act.

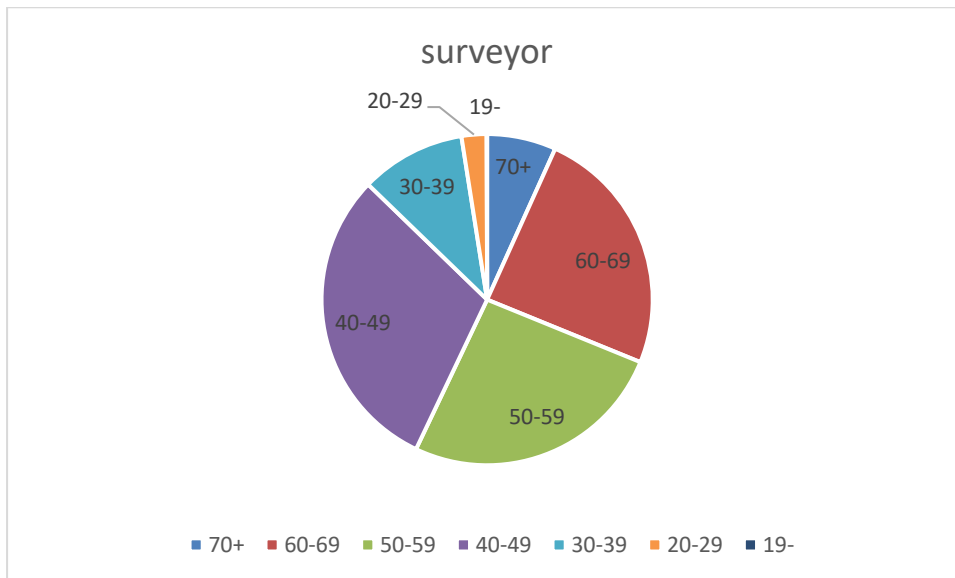


Figure 4. Age structure of licensed surveyors (Arranged from statistics in Report on FY2018 Fact-Finding Survey of Surveyors and Assistant surveyors in Survey companies)
As surveyors can do assistant surveyors' job, we count those who are licensed in both categories as surveyors

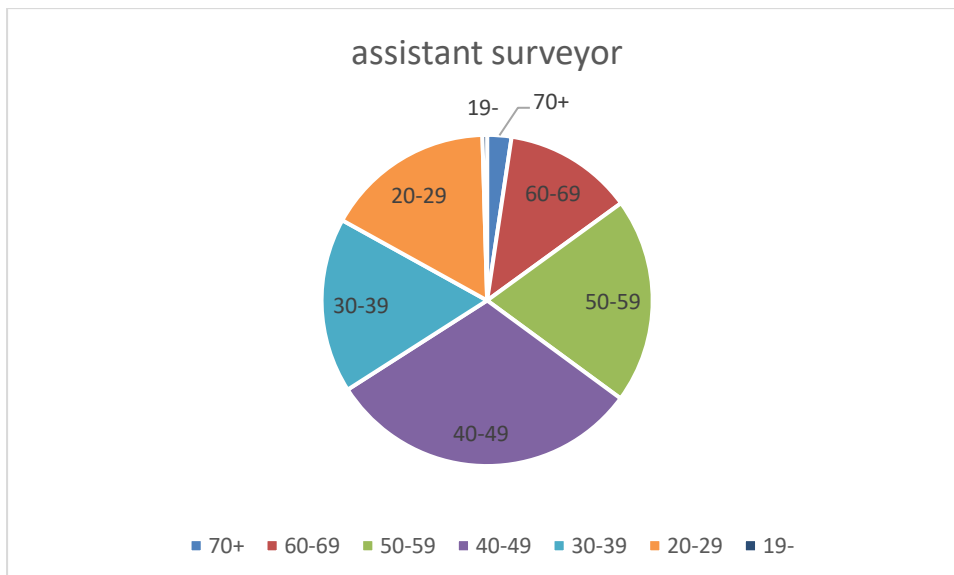


Figure 5. Age structure of licensed assistant surveyors (Arranged from statistics in Report on FY2018 Fact-Finding Survey of Surveyors and Assistant surveyors in Survey companies)

To ease shortage of licensed surveyors, main way is to recruit young people and educate. Another way to meet urgent needs is to educate assistant surveyors and let them get license of surveyors. When surveyors are placed, they must usually get accredited certificates or record their experience so that they are so recognized by project owners to win conditioned tender. This part is born by societies or neutral bodies concerning each specific field.

4. Lifelong Education of Surveyors

Not only for keeping number of licensed surveyors in a company, it is necessary for survey companies to promote their staffs keep learning or studying. As advancement of survey technologies are rather rapid, even after acquisition of license, surveyors must keep learning and catching up such advancement. Very often project owners request team leaders of survey party are well educated and have enough experience. Certificates of their lifelong education record are attribute with some positive point in conditioned tender. To meet demand of surveyors' lifelong education, Japan Surveyors Association (JSA) provides "Continuing Professional Development" program. Many societies or associations of survey related bodies join this program. JSA play a role of steering committee and prepares basic courses common to all. Each society or association prepares specific course fit for their field. Each course is attached CPD points according to importance of knowledge/experience. Project owners quite often request finishing some course and some amount of CPD points for surveyor who is to be leader of survey team of project. This CPD points are tributed to person. This system encourages even elder surveyors to keep their level and learn new technologies and regulations.

In case of cadastral survey, Japan Land Survey Association (association of survey companies working for Cadastral Survey) (JLSA) issue certificate of Cadastral Survey Meister and

Bearer of Cadastral Survey. Those certificates are recognised by municipalities who are owners of cadastral survey project.

5. Role of vocational schools

Besides universities, students can get license of surveyor through education in vocational schools. Vocational schools are divided into two categories. One is just vocational school. Students can learn surveying, but they must take for examination by GSI. The other is officially registered survey school/course. Teachers, equipment, curriculum, and syllabus are strictly controlled by regulation and students successfully graduate are given assistant surveyor’s license. Through experience, they can get surveyor’s license. Among registered survey schools, two of them opens special course for assistant surveyors. By finishing the one-year intensive course, they can get surveyor’s license (Figure 3). This course is called article 50 section 4 course. This course helps shift assistant surveyors to surveyors efficiently. It can ease companies’ demand of increasing number of licensed surveyors partly.

It is all survey related parties’ role to pave the way for young people to select survey as their profession. Presently, 100% of graduates who want job in survey companies are accepted in case of new graduates of registered vocational schools. The important point is the very entrance to the profession. Because population of young generation is decreasing in Japan, (Figure 7)we must attract young people to this profession. The situation is competitive among professions.

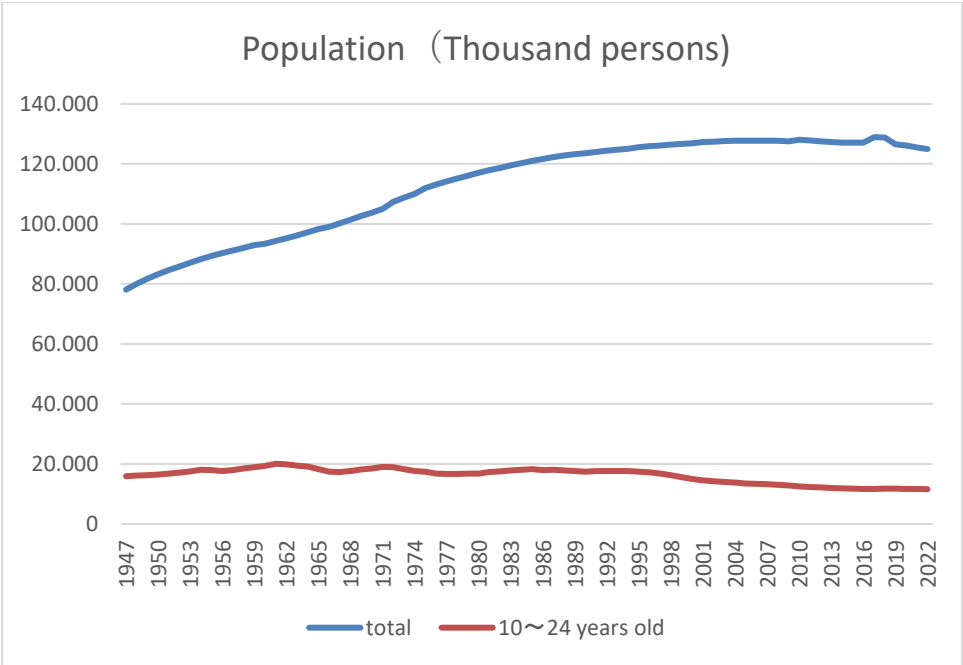


Figure 6 Population change in Japan
Based on data by Statistics Bureau of Japan available through "Portal Site of Official Statistics of Japan (e-stat)",

Figure7 shows remarkable decrease of school to university age people since late 1990's. Necessity of qualified surveyors is not decreasing even by automation or digital treatment of field data. The situation is similar over other professions. Efficiency increased by digitalization and automation. Planning, management, checking quality are to be done by qualified, experienced surveyors. Demand of human resources is still high.

We are facing decline of number of students apply for vocational schools in surveying. We must encourage young people to apply for survey schools or survey courses in universities.

6. Conclusion

Cadastral Survey based on National Land Survey act is steadily advancing with effort of municipalities and local survey companies. Government's strong will continuously keep steady amount of budget. On the other hand, many of survey companies face problem on recruiting technical staff especially those who have license. Registered vocational schools are doing best efforts to educate young people so that they can get assistant surveyor's license and after experience, get surveyor's license. In addition, two of them accept those who have assistant surveyor's license and educate them in intensive course so that they can get surveyor's license in one year. At the same time vocational schools themselves are facing decrease of students. The most important thing is to attract young people to our profession. There are many attracting points in being surveyors.

-Surveyors working in local companies can work in their hometown

-Any civil engineering project needs survey professionals

-Land Administration is important part of local government or municipality's activities

-By virtue of technical advancement, operation of apparatus in field survey is getting easier

-Surveyors are relied upon in case of natural disasters.

-Market of surveying is rather stable. Even under COVID19, survey project was stable
We must enhance our publicity activity so that we can appeal surveying is an attractive profession. We must show importance of our profession to society.

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Discussion here is mostly based on reports written in Japanese.

I apologize for inconvenience.

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BIOGRAPHICAL NOTES

Graduated Faculty of Science (Physics), Nagoya Univ. in 1975

Geographical Survey Institute, Ministry of Land, Infrastructure, Transport and Tourism from 1975 till 2005

Japan Construction Information Center Foundation from 2005 till 2015

Advisor, Pasco Corporation from 2015 till Now

Managing Director, Surveyor Education Center Foundation from 2016 till Now

CONTACTS

Masaru Kaidzu

Managing Director,

Surveyor Education Center Foundation

Kurihara, aza Yamajiri 3514-20

Tsukuba, Ibaraki 305

Japan

Email: kaidzu@ra2.so-net.ne.jp

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Masaru Kaidzu (Japan)

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