

# A Comparative Study on the Location of Large-scale Retail Stores in Damaged and Non-Damaged Areas: The Case of the Hanshin-Awaji Earthquake

阪神・淡路大震災後の商業復興と大規模小売店舗の進出状況に関する研究

Shohei BENIYA\*

紅谷 昇平\*

Akihiko HOKUGO\*\*

北後 明彦\*\*

## Abstract

阪神・淡路大震災後、地域商業の復興が遅れており、その一因として、大規模店舗の出店数の増加が考えられている。本研究では、被災の激しかった臨海地域における大規模店舗の進出状況を、震災前後の土地利用の変化に着目して分析を行った。また、被災地外である大阪市北部の都市との比較分析を行った。

その結果、酒造産業を中心とした産業系施設用地において大規模店舗の出店が増加していること、阪神間地域に類似した大阪府北部の4市と比較して被災地では商業系の敷地の再開発のパターンも多いこと、大規模店舗が数多く立地した西宮市、神戸市東灘区、灘区において大規模店舗はJR以南の地域に集中しており、このJR以南の商店街は以北の商店街に比べて、商店数、販売額とも減少傾向にあることが明らかになった。地域商業の復興は、商業単独ではなく、被災した産業用地の跡地利用のコントロールなど産業間の連関を踏まえた広い視点が必要である。

*Keywords: Hanshin-Awaji earthquake, local commerce recovery, large-scale retail stores, downtown, land use*

キーワード：阪神・淡路大震災、地域商業復興、大規模店舗、中心市街地、土地利用

## 1. Introduction

### 1.1 Background

Thirteen years have elapsed since the Hanshin-Awaji earthquake of 1995. One of the biggest problems that the damaged areas are still faced with is the delay in the revival of local commerce in the local shopping district or central town area. One of the factors of the delay of commercial revival is considered to be the migration of population to other areas after the earthquake. However, currently, even though the population numbers have been recovered, the retail sales have not. It is also important to consider the changes in the socioeconomic environment—such as competition with large-scale stores—in the damaged areas<sup>(1)</sup>.

Over the past few years, a considerable number of studies have been conducted on this issue, such as case studies on local revival processes or questionnaire surveys pertaining to shopping actions and consumer consciousness. However, thus far, only a few studies have attempted to conduct research on the large-scale retail stores in damaged areas<sup>(2)</sup>. It is important to analyze the process of increase of large-scale retail stores following the earthquake.

### 1.2 Purpose

In this study, we intend to compare some of the cities and wards that were damaged by the Hanshin-Awaji earthquake with the areas that were not. The purpose of this study is to clarify the actual situation of large-scale retail stores in damaged areas and analyze the changes in land use before and after the earthquake.

## 2. Method

### 2.1 Target Areas

The target areas comprise Ashiya city, Nishinomiya city, and six wards in Kobe city (Higashi Nada ward, Nada ward, Chuo ward, Hyogo ward, Nagata ward, Suma ward), all of which suffered extreme damages. Japan Railways (JR) lines, private railways (Hanshin Electric Railway, Hankyu Corporation, Sanyo Train), highways (Hanshin Expressway Kobe Line), and national routes

---

\* 正会員・人と防災未来センター (Disaster Reduction and Human Renovation Institution)

\*\* 正会員・神戸大学都市安全研究センター (Professor, Research Center for Urban Safety and Security, Kobe University)

(Nos. 2, 43) in the East–West directions all cut across these affected areas. The plying of traffic is an important geographical condition for the running of commercial facilities. The abovementioned areas are all similar in terms of traffic conditions.

For a comparison, we considered four cities in the north of Osaka, which were not affected by the earthquake—Toyonaka city, Suita city, Ibaraki city, and Takatsuki city. These are the satellite cities of Osaka, and they are similar to the Hanshin Kobe area in terms of geographical conditions, scale of population, and industrial structure.

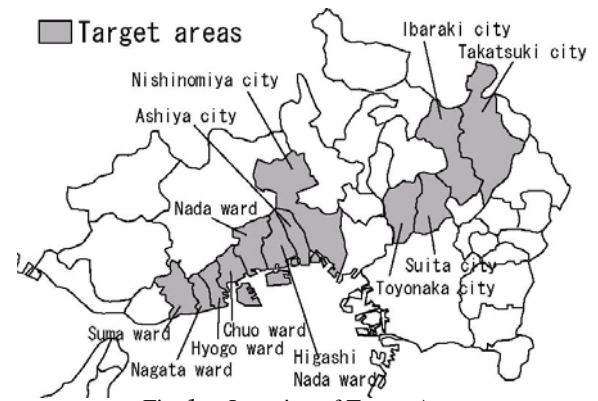


Fig. 1 Location of Target Areas

## 2.2 Objective Retail Stores

First, we collected location data for the large-scale retail stores opened after the earthquake, in the target areas. The objective large-scale retail stores are those reported by the Large Scale Store Law from 1995 to 1999 and the Large Scale Stores Location Law from 2000 to 2004, having a floor area of above 1,000 square meters. Based on documents<sup>1)</sup>, we conducted research on how this land was used prior to the earthquake; in the same manner, we analyzed the type of businesses, scale of floor areas, and the processes of increase of the new retail stores after the earthquake<sup>2), 3), 4), 5)</sup>.

## 3. Location Analysis of the Large-scale Retail Stores

### 3.1 Locations and Opening Times of the Stores

The openings of the large-scale retail stores in the damaged areas increased significantly in 1997. In 1999 and 2000, immediately prior to the enforcement of the Large Scale Stores Location Law, there was a further increase in the number of large-scale retail stores that opened in the damaged areas. In particular, ten large-scale retail stores were opened in 2000 itself in Nishinomiya city. However, after the earthquake disaster, there were no new large-scale retail stores in Ashiya city. Therefore, Ashiya city has been excluded from this analysis.

Table1. The number of newly opened large-scale retail stores

|                       | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | Sum |
|-----------------------|------|------|------|------|------|------|------|------|------|-----|
| Higashi Nada ward     | 1    | 2    | 1    | 2    | 1    | 1    | 1    | 1    | 0    | 10  |
| Nada ward             | 3    | 2    | 0    | 2    | 2    | 0    | 0    | 2    | 3    | 14  |
| Chuo ward             | 1    | 1    | 1    | 2    | 0    | 0    | 2    | 1    | 1    | 9   |
| Hyogo ward            | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 5   |
| Nagata ward           | 0    | 0    | 1    | 1    | 1    | 0    | 0    | 3    | 3    | 9   |
| Suma ward             | 0    | 1    | 0    | 0    | 2    | 0    | 0    | 0    | 1    | 4   |
| Nishinomiya city      | 0    | 4    | 1    | 2    | 10   | 1    | 1    | 3    | 3    | 25  |
| Ahiya city            | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0   |
| Sum of damaged areas  | 6    | 11   | 4    | 10   | 17   | 2    | 4    | 11   | 11   | 76  |
|                       | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | Sum |
| Toyonaka city         | 2    | 1    | 1    | 2    | 2    | 0    | 0    | 1    | 0    | 9   |
| Suita city            | 2    | 1    | 2    | 2    | 0    | 0    | 1    | 1    | 0    | 9   |
| Takatsuki city        | 0    | 1    | 0    | 2    | 3    | 0    | 0    | 2    | 3    | 11  |
| Ibaraki city          | 2    | 1    | 1    | 0    | 2    | 1    | 0    | 0    | 1    | 8   |
| Sum of compared areas | 6    | 4    | 4    | 6    | 7    | 1    | 1    | 4    | 4    | 37  |

We calculated the cumulative ratio of the floor areas of the newly opened large-scale retail stores (CROFAL, in brief)<sup>3)</sup>. The numerator of CROFAL equals the sum of the areas of the large-scale stores opened after 1996; the denominator is the floor areas of all the retail stores in the city or ward in 1994, just prior to the earthquake. Initially, CROFAL increased in Nada and Higashi Nada after the earthquake, and in 2000, CROFAL increased in Nishinomiya. In Nagata, where commercial revival was delayed, CROFAL showed a sudden increase after 2003 due to the completion of the redevelopment of the Shin-Nagata south district. CROFAL increased only slightly in Suma, Hyogo, Chuo, and in four non-damaged cities of north Osaka.

### 3.2 Types of Businesses

With regard to the types of businesses in which the large-scale stores were involved in the damaged areas, there were 25 supermarkets, 19 malls, 16 large specialty stores, 14 home centers, 1 department store, and 1 shopping center. In the non-damaged

cities of north Osaka, there were 19 supermarkets, 14 home centers, 10 large specialty stores, 2 malls, and 1 shopping center. It can be seen that the damaged areas had more malls than did the non-damaged areas.

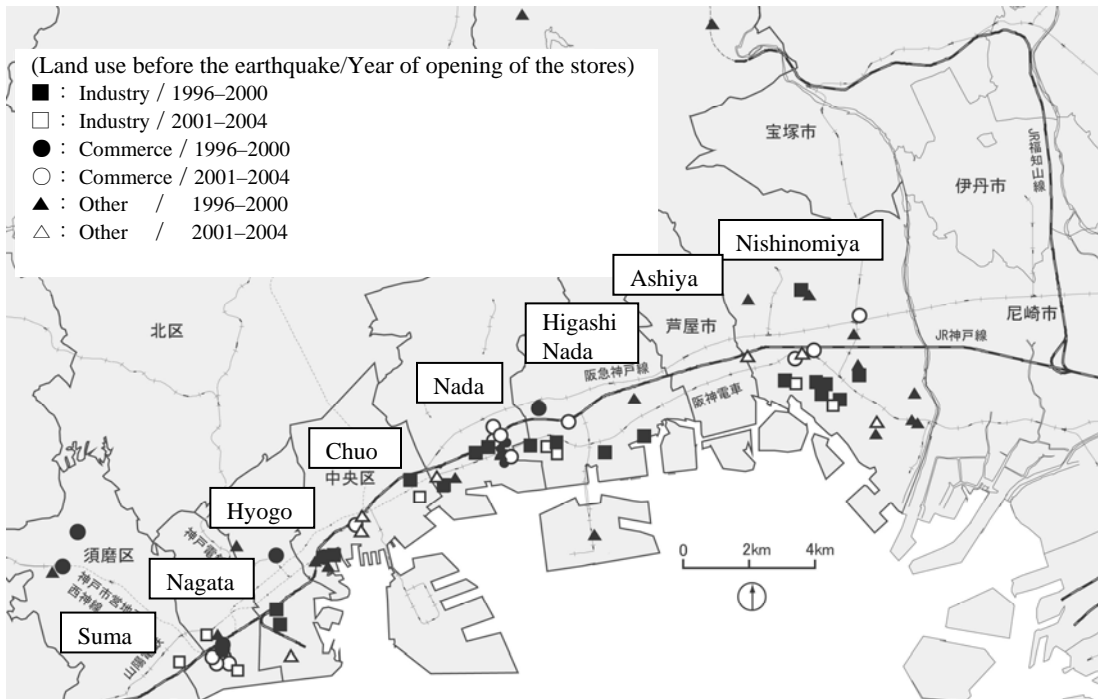


Fig.2 Location of Newly Opened Large-scale Retail Stores in Damaged Areas

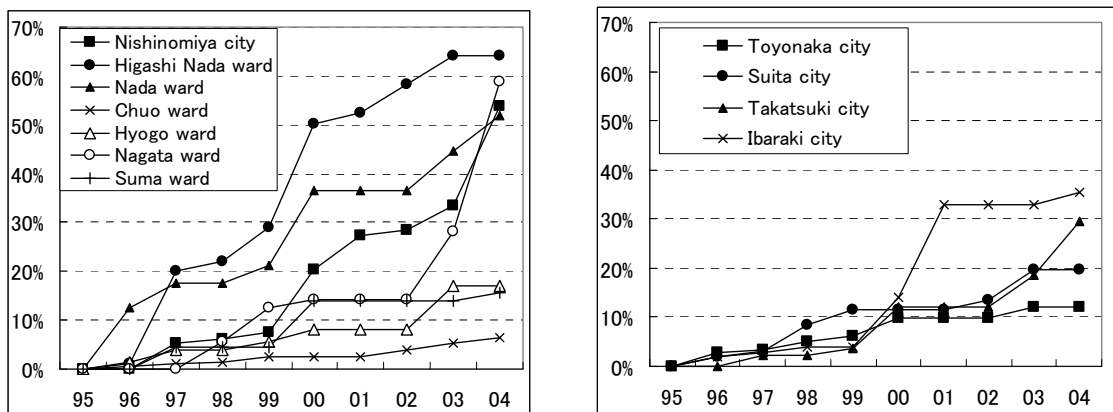


Fig.3 Cumulative Total Ratio of Floor Area of Newly Opened Large-scale Retail Stores

(=Sum of Floor Areas of Large-scale Retail Stores opened after 1996 / The Areas of All the Retail Stores in 1994)

## 4. Changes in Land Use in the Damaged Areas

### 4.1 Land Use before the Earthquake

In the damaged areas, 26 sites (34.2%) were used for industries prior to the earthquake, and ten (13.2%) of these sites were used for sake industries. The sites used for industries had a large area (an average of 5,541 square meters), which was suited for the large-scale retail stores.

Subsequently, 24 sites (31.6%) were used for commercial facilities before the earthquake. Of these, 14 sites (18.4%) were established due to redevelopment or cooperative rebuilding. Additionally, there were 11 sites for unused land, 6 sites for offices or research institutes, 4 sites for company condominiums, and 2 sites for housing.

On the other hand, before the earthquake, there was more unused land and less land used for commercial facilities compared to the land use of the sites that are presently used as large-scale retail stores in the four non-damaged cities.

Table2. Previous use of the sites of present large-scale retail stores

| Land use<br>before the earthquake | Damaged areas |       |                        |                                | Sum of the four cities in North Osaka |       |                        |                                |
|-----------------------------------|---------------|-------|------------------------|--------------------------------|---------------------------------------|-------|------------------------|--------------------------------|
|                                   | Number        | Ratio | Area (m <sup>2</sup> ) | Average area (m <sup>2</sup> ) | Number                                | Ratio | Area (m <sup>2</sup> ) | Average area (m <sup>2</sup> ) |
| Industrial facilities             | 26            | 34%   | 144,054                | 5,541                          | 13                                    | 31%   | 120,875                | 9,298                          |
| Sake industries                   | 10            | 13%   | 53,249                 | 5,325                          | 0                                     | 0%    | 0                      | -                              |
| Offices, laboratories             | 6             | 8%    | 27,404                 | 4,567                          | 0                                     | 0%    | 0                      | -                              |
| Unused land                       | 11            | 14%   | 57,531                 | 5,230                          | 20                                    | 48%   | 95,988                 | 4,799                          |
| Commerce facilities               | 24            | 32%   | 104,433                | 4,351                          | 7                                     | 17%   | 33,593                 | 4,799                          |
| Redevelopment                     | 14            | 18%   | 76,329                 | 5,452                          | 6                                     | 14%   | 31,596                 | 5,266                          |
| Company condominiums              | 4             | 5%    | 13,575                 | 3,394                          | 0                                     | 0%    | 0                      | -                              |
| Housing                           | 2             | 3%    | 4,581                  | 2,291                          | 0                                     | 0%    | 0                      | -                              |
| Other                             | 3             | 4%    | 49,046                 | 16,349                         | 2                                     | 5%    | 7,256                  | 3,628                          |
| Sum                               | 76            | 100%  | 400,624                | 5,271                          | 42                                    | 100%  |                        | 0                              |

#### 4.2 Characteristic of Previous Land Use according to Cities and Wards

Sixty percent of the sites of large-scale stores in Higashi Nada ward were used for industrial facilities before the earthquake. In particular, 30% and 24% of the sites in Higashi Nada ward and Nishinomiya city, respectively, were used for sake industries. On the other hand, many sites in Nada ward and Nagata ward were used for commerce facilities.

Table3. The situation of previous land use according to area

| Land use<br>before the earthquake | Damaged areas |      |      |       |        |      |             | four cities in North Osaka |          |       |           |         |     |
|-----------------------------------|---------------|------|------|-------|--------|------|-------------|----------------------------|----------|-------|-----------|---------|-----|
|                                   | Higashi Nada  | Nada | Chuo | Hyogo | Nagata | Suma | Nishinomiya | Sum                        | Toyonaka | Suita | Takatsuki | Ibaraki | Sum |
| Industrial facilities             | 6             | 3    | 3    | 2     | 2      | 1    | 9           | 26                         | 2        | 3     | 5         | 3       | 13  |
| Sake industries                   | 3             | 1    | 0    | 0     | 0      | 0    | 6           | 10                         | 0        | 0     | 0         | 0       | 0   |
| Offices, laboratories             | 0             | 3    | 2    | 1     | 0      | 0    | 0           | 6                          | 0        | 0     | 0         | 0       | 0   |
| Unused land                       | 2             | 0    | 2    | 0     | 0      | 1    | 6           | 11                         | 7        | 4     | 3         | 6       | 20  |
| Commerce facilities               | 2             | 8    | 2    | 1     | 6      | 2    | 3           | 24                         | 3        | 2     | 2         | 0       | 7   |
| Redevelopment                     | 1             | 3    | 0    | 1     | 6      | 0    | 3           | 14                         | 3        | 2     | 1         | 0       | 6   |
| Company condominiums              | 0             | 0    | 0    | 0     | 1      | 0    | 3           | 4                          | 0        | 0     | 0         | 0       | 0   |
| Housing                           | 0             | 0    | 0    | 0     | 0      | 0    | 2           | 2                          | 0        | 0     | 0         | 0       | 0   |
| Other                             | 0             | 0    | 0    | 1     | 0      | 0    | 2           | 3                          | 0        | 1     | 1         | 0       | 2   |
| Sum                               | 10            | 14   | 9    | 5     | 9      | 4    | 25          | 76                         | 12       | 10    | 11        | 9       | 42  |

Table4. The situation of previous land use according to present business type in the damaged areas

| Land use before the earthquake | Department stores | Malls | Shopping Centers | Super markets | Home centers | Large specialized stores | Sum |
|--------------------------------|-------------------|-------|------------------|---------------|--------------|--------------------------|-----|
| Industrial facilities          | 0                 | 0     | 0                | 13            | 8            | 5                        | 26  |
| Sake industries                | 0                 | 0     | 0                | 4             | 4            | 2                        | 10  |
| Offices, laboratories          | 0                 | 2     | 0                | 0             | 2            | 2                        | 6   |
| Unused land                    | 1                 | 3     | 0                | 4             | 2            | 1                        | 11  |
| Commerce facilities            | 0                 | 13    | 0                | 6             | 0            | 5                        | 24  |
| Redevelopment                  | 0                 | 11    | 0                | 2             | 0            | 1                        | 14  |
| Company condominiums           | 0                 | 0     | 0                | 2             | 0            | 2                        | 4   |
| Housing                        | 0                 | 0     | 0                | 0             | 1            | 1                        | 2   |
| Other                          | 0                 | 1     | 1                | 0             | 1            | 0                        | 3   |
| Sum                            | 1                 | 19    | 1                | 25            | 14           | 16                       | 76  |

#### 4.3 Characteristic of Previous Land Use According to Business Types in Damaged Areas

According to the business types of the present large-scale retail stores in the damaged areas, the sites that were previously used for industries tended to be now used for supermarkets, home centers, and large specialty stores. The sites that were formerly used for commercial facilities tended to now be used for malls and not home centers.

#### 4.4 Opening Times of the Large-scale Retail Stores According to Previous Land Use in the Damaged Areas

According to the land use before the earthquake, Fig.4 shows the cumulative number of large-scale stores that newly opened from 1995 to 2004. The number of sites formerly used for commercial facilities increased smoothly just after the earthquake;

however, the number of sites for redevelopment increased rapidly after 2003. This is because the redevelopment process requires a considerable amount of time for coordination among land owners.

With regard to the sites that were formerly used as industries, many large-scale retail stores located at these sites were used for sake industries before 1998. In 1999 and 2000, just before the enforcement of the Large Scale Stores Location Law, these sites, except for those used for sake, were used for large-scale retail stores.

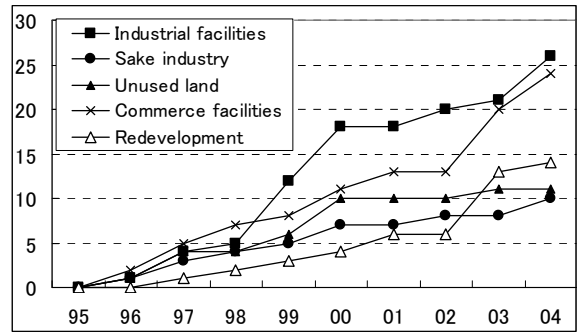


Fig.4 Cumulative Number of Large-scale Stores Newly Opened, According to Previous Land Use, in the Damaged Areas

### 5. Influence of the Large-scale Retail Stores on the Local Shopping Districts in the Damaged Areas

Large-scale stores densely opened in Nishinomiya city, Higashi Nada ward, and Nada ward after the earthquake. There were more stores to the south of the JR line compared to the north area considering the proportion of number of large-scale stores and population.

Table5. Difference in the density of large-scale stores between the north and south<sup>(4)</sup>

|                      | Ratio of large-scale stores |                   |           | Population ratio  |                   |           |
|----------------------|-----------------------------|-------------------|-----------|-------------------|-------------------|-----------|
|                      | Nishino miya city           | Higashi Nada ward | Nada ward | Nishino miya city | Higashi Nada ward | Nada ward |
| North of the JR line | 28.0%                       | 10.0%             | 7.1%      | 50.9%             | 31.7%             | 67.7%     |
| South of the JR line | 72.0%                       | 90.0%             | 92.9%     | 49.1%             | 68.3%             | 32.3%     |
| Sum                  | 100.0%                      | 100.0%            | 100.0%    | 100.0%            | 100.0%            | 100.0%    |

We have divided these three cities and wards into two areas, according to the point at which the JR line cuts through them; these have been analyzed comparatively. Fig.5 shows the changes in the number of stores and the retail sales of local shopping districts in the north and south of the JR line in Nishinomiya city, Higashi Nada ward, and Nada ward. Indicators are converted based on the rule that the value in 1994 (just before the earthquake) changes to 100. South of the JR line, there is a rapid drop in the number of stores and in the retail sales. One explanation for these differences may be the intensified competition among large-scale retail stores that opened after the disaster.

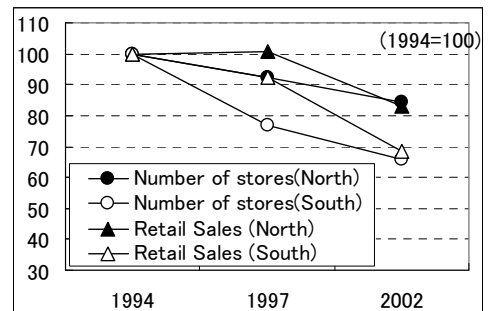


Fig.5 Comparison of the Number of Stores and the Retail Sales in the Local Shopping District between the North and South of the JR Line (1994 = 100)<sup>(5)</sup>

### 6. Discussion

This study has elucidated three problems. The first is a time gap between cooperative rebuilding or redevelopment of the damaged local shopping districts and the opening of large-scale retail stores on former industrial sites. In heavily damaged areas, there were vacant areas of the commercial function just after the earthquake because some of the damaged stores were temporarily forced to suspend operations. New large-scale retail stores opened quickly after the earthquake and filled in this existing vacancy. On the other hand, the existing local shopping district needed more time to recover by redevelopment or cooperative rebuilding.

The second problem refers to the importance of land management. Local commerce and industries are closely connected. Large-scale retail stores tended to be located on sites that were formerly used for industries. If a manufacturing business is damaged by an earthquake, it will sell or lend its land that is used for factories or warehouses. For example, the sake industries in damaged areas suffered not only due to the earthquake but also because of the long-term decrease in the demand for sake<sup>(7)</sup>.

The last problem is the need for a special control system of large-scale stores after an earthquake. Recovery programs such as the redevelopment of the local shopping district need a long time for completion. In order to ensure fair competition, there may be some control schemes between the existing local shopping districts and the large-scale stores that will be newly opened in the damaged areas.

The revision of the Large Scale Store Law in 2000 has a great deal of importance. It is necessary to consider that this revision affected the actions of the large-scale retail stores. Furthermore, we should take into account issues that exist apart from the situation

of the Hanshin-Awaji earthquake. The City Planning Law, revised in 2006, restricted zoning for large-scale stores. Recently, some local governments have introduced an ordinance calling for the regulation of large-scale stores.

## 7. Conclusion

Since the earthquake occurred, in 1995, till 1998, new large-scale retail stores such as supermarkets or home centers opened on sites that formerly used for industries and commercial facilities; this was the case mainly in Nada and Higashi Nada wards. In addition, although cooperative rebuilding or redevelopments of the shopping districts had been started, this needed a considerable amount of time for completion.

From 1999 to 2000, many large-scale retail stores were opened on the sites formerly used for industries, particularly sake industries; this was the case mainly in Nishinomiya city and Higashi Nada ward, which were severely damaged by the earthquake. There are two primary reasons for this. One was the revision of the Large Scale Stores Location Law in 2000. Many companies decided to open new stores before the revision. The other reason was that many manufacturing businesses such as sake industries faced heavy damages due to the earthquake.

Compared to the damaged areas, in the non-damaged areas of north Osaka, there was a smaller increase in large-scale retail stores. Of these, many of the large-scale retail stores in north Osaka, were opened in unused car lots or in open yards. In the damaged areas, many large-scale retail stores also opened on the sites that were formerly used for commercial facilities, however few large-scale retail stores opened in the non-damaged areas.

In Nishinomiya city, Higashi Nada ward, and Nada ward, where many large-scale retail stores exist, most of these stores lie to the south of the JR line. South of the JR line, there is a rapid drop in the number of stores and in the retail sales of local shopping district after the earthquake compared to those to the north.

The damages faced by the manufacturing facilities impacted the retail markets. Therefore, it is important to consider the relationships among industries such as retail, manufacturing, and distribution.

\*This paper is the revised and translated paper of “A study on location of Large Scale Retail Stores in the Disaster-Hit Areas by Hanshin-Awaji Earthquake”<sup>8)</sup> written in Japanese.

## Notes

- (1) “Retail Sales in Kobe was about 80% of those prior to the earthquake, and middle-scale and large-scale retail stores got ahead in business”, described in “A Report of the General Assessment of the Recovery in Kobe”, Conference of Recovery Promotion of Kobe city, 2004
- (2) There were some studies about the revival of local commerce such as Kumagai (1996, Journal of the City Planning Institute of Japan), Yamaguchi Kazuhumi (1997, Research Report of Hyogo Region), Konishi Kazuhiko (2000, Urban Policy), Shiozaki et al. (2002, Nihon Keizai Hyoron), Onishi kazuyoshi (2003, Journal of Institute of Social Safety Science), Ando Motoo(2003,2004, Gakugei Syuppan), but these studies didn't mainly intended for large-scale retail stores.
- (3) = (Sum of Floor Areas of Large-scale Retail Stores opened after 1996) / (The Areas of All the Retail Stores in 1994)
- (4) Population was counted by fourth mesh of population census in 2000

## References

- 1) “House Map”, Zenrin, (1993, 1994, 2004)
- 2) “List of large-scale retail stores in Hyogo Prefecture”, Hyogo prefecture, (1998)
- 3) “Merchant Map in Kobe”, Kobe city, (2000)
- 4) “Comprehensive list of large-scale retail stores in Japan”, Toyo Keizai inc, (1992-2005)
- 5) “List of large-scale retail stores reported by the Large Scale Stores Location Law”, Ministry of Economy, Trade and Industry, (2005)
- 6) “Commercial statistics”, Ministry of Economy, Trade and Industry, (1994, 1997, 2002)
- 7) Yamamoto S., “Present Situations and problems in Nada Gogou”, Kobe Institute of Urban Research, Urban Policy, No.98, (2000), pp.55-66
- 8) Beniya S., Murosaki Y., Hokugo A., “A study on location of Large Scale Retail Stores in the Disaster-Hit Areas by Hanshin-Awaji Earthquake” Journal of the City Planning Institute of Japan, (2005), pp721-726.