

A Study on the Present Condition and Classification of Plans of Public Housing for the Handicapped

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Abstract

The population of handicapped people in Japan has increased in recent years, and TOKUMOKU apartment has played an important role as a place of residence for such people with handicaps. In this paper, TOKUMOKU apartment is defined as public housing for those who need social welfare care, such as handicapped and elderly people. As mentioned above, the purpose of this study is to grasp the present condition of TOKUMOKU apartment by the questionnaire for local government in the Japan whole country, and to clarify the present trend of the floor plan of TOKUMOKU apartment by analyzing the latest 125 examples. The results are as follows. 1) It was obvious that the number of TOKUMOKU apartments in Japan has increased more greatly than about 40 years ago. 2) The most common dwelling unit type was 2 bedrooms without a living room, called 2DK type in Japan. Although 2DK type is the most common, 2LDK type which has 2 bedrooms with a living room is increasing in number now. 3) It was clear that the total floor area of the dwelling unit has increased, compared to about 40 years ago. 4) It was revealed that the dwelling unit with a Japanese-style room decreased and the dwelling unit with a Western-style room has increased, by classifying the plan of TOKUMOKU apartment. From the above, the supply of TOKUMOKU apartment progressed and the living environment of a resident with handicap was also improved, compared to about 40 years ago. However, since the new supply of public housing is restricted by the housing policy of the Japanese government, it is necessary to consider the new supply method of TOKUMOKU apartment which is independent of public housing.

Keywords: Public housing, handicapped people, TOKUMOKU apartment, wheelchair

1. Introduction

According to the data of the Ministry of Health, Labor and Welfare, the number of handicapped people in Japan has increased in recent years. It was about 1.98 million people in 1980, but it is about 4.36 million people in 2016. As a place of residence for people with handicaps, public housing plays an important role. The rent of public housing is less expensive than other neighboring private rental housing. Therefore, public housing is important for people with low incomes such as handicapped and elderly people. Despite the high demand of public housing for handicapped people, the number of public housing apartments has declined slightly in

recent years. Especially consideration at the planning stage of housing for handicapped people is required. It is necessary for the apartment for wheelchair users to be designed at special dimensions in consideration of the use of the wheelchair unlike ordinary residences. In this paper, TOKUMOKU apartment is defined as public housing for those who need social welfare care, such as handicapped and elderly people. Although there are a lot of studies about public housing in Japan, there are few studies about TOKUMOKU apartment. Most of slight studies of TOKUMOKU apartment were performed by Kataoka and others approximately 40 years ago. Family's composition and lifestyle have changed since 40 years ago, and the number of handicapped people is increasing rapidly. In order to make public housing play an important role as a residence of handicapped people, it is necessary to pay attention to TOKUMOKU

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apartment once again and to grasp the actual condition of TOKUMOKU apartment.

2. Methods

This research had two surveys. The first survey was a questionnaire survey for 336 self-governing bodies in the Japan whole country. Information on 242 self-governing bodies were gathered by the questionnaire survey. As of the end of March 2016, the number of public housing apartments was 2.17 million in Japan. Since approximately 1.42 million apartments were applicable to the first survey and were more than half of the total number, it is considered that the results of this survey indicate whole national trend. And the secondary survey was a survey to gather floor plans of TOKUMOKU apartment. The floor plan of the latest case of TOKUMOKU apartment of each self-governing body was collected. In Yamaguchi prefecture, all floor plans of TOKUMOKU apartment were gathered. In total, 125 floor plans were collected. The first survey was conducted from July to August 2017, and the second survey was conducted from September to October 2017.

3. Result

3.1 Present condition of TOKUMOKU apartment

From the results of the first survey, the number of TOKUMOKU apartments had increased compared to about 40 years ago (Table1). However, the ratio of TOKUMOKU apartment in the whole public housing is as low as 0.7% (Table2). Fig.1 shows the quantity of the public housing and TOKUMOKU apartments per 1000 persons of each self-governing body. Some self-governing bodies had few TOKUMOKU apartments and others had many TOKUMOKU apartments. That is, the number of TOKUMOKU apartments was not related to the number of public apartments. Therefore, it is considered that the number of constructions of TOKUMOKU apartments is not affected by the population scale. Namely, it is inferred that the number of constructions of TOKUMOKU apartments depends on the supply policy of the public housing of each self-governing body.

3.2 Dwelling unit type

Table 3 indicated dwelling unit type from 125 floor plans collected by the second survey. Dwelling unit type which has bedroom, kitchen and

Table 1. Survey outline

	Distribution	Collection	Collection rate	Government that have built TOKUMOKU apartment	Collected floor plans
Prefectures	47	44	93.61%	39	15
Cities	289	260	89.96%	203	110
Total number	336	304	90.47%	242	125

Table 2. The number of public housing apartments

	Residential building	Dwelling unit	TOKUMOKU apartment for wheelchair users	TOKUMOKU apartment for others except wheelchair
Total number	63465	1424726	10058	4620
Average per self-governing body	262.3	5887.3	41.6	19.1
Ratio	-	100%	0.70%	0.32%

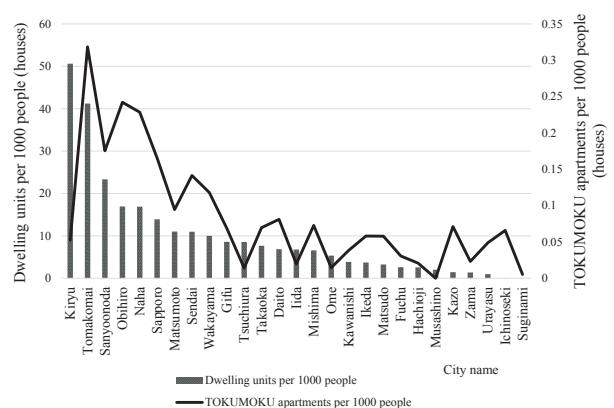


Fig.1. The quantity of public housing and TOKUMOKU apartments per 1000 persons

dining room without living room is called DK type in Japan, dwelling unit type which has bedroom, kitchen, dining room and living room is called LDK type in Japan, and initial number shows the number of bedrooms. In the result of this survey, 2DK type is the most common type. However, as the recent trend, LDK type has the higher ratio of increase. As mentioned above, it is considered that a plan layout varied from DK type to LDK type by the change of the lifestyle in recent years.

3.3 Total floor area and DK, LDK area

Fig.2 pointed to the relationship between the total floor area and the area of DK and LDK. In the past research, the total floor area of most TOKUMOKU apartments was less than 50 square meters. However, in this survey, most of them were from 60 to 80 square meters. Moreover, there were some cases exceeding 90 square meters. The area of DK or LDK was mostly from 10 to 20 square meters in

Table 3. The classification of the latest 125 floor plans

Dwelling unit type	DK type			Subtotal	LDK type			Subtotal	Others		Subtotal	Total number
	1DK	2DK	3DK		1LDK	2LDK	3LDK		1R	1LK		
TOKUMOKU number	11	50	17	78	5	37	3	45	1	1	2	125

the past research. Approximately halves of DK or LDK in this survey were from 10 to 20 square meters, but there were also many examples over 20 square meters. Compared with the past research, both the total floor area and the area of DK and LDK increased. This showed that the level of area has improved.

4. Classification of floor plan

4.1 Definition of Classification

In this study, the collected 125 floor plans were defined as follows and classified. (1) Main room: Room used by the wheelchair user closest to DK and LDK. (2) Continuity of rooms: Two rooms connected by the sliding door. (3) Discontinuity of rooms: Two rooms connected by the hinged door, or room connected by the corridor. (4) Independence of DK or LDK: DK or LDK which can be accessed only by passing through the corridor. However, priority is given to the indicated name when the room name is indicated in the floor plan. Tables 3 and 4 show the classification of floor plans by the above definition.

4.2 Characteristics about DK type

In the past study there were 39 cases of 2DK type.

Among them, 17 floor plans were DK facing the south and the other floor plans were DK facing the north. Moreover, there were 17 floor plans in which DK and Western-style room were consecutive, 12 floor plans in which DK continued with Japanese-style room, and 10 floor plans in which DK was independent. A type of DK or LDK facing the south is defined as a South DK or LDK type. And a type of DK or LDK facing the north type is defined as North DK or LDK type. On the other hand, in this survey, there were 50 cases of 2DK type. Among them, 36 floor plans were South DK type and the other floor plans were North DK type. This showed that the South DK type increased more than twice the North DK type. And there were 26 floor plans in which DK and Western-style room were consecutive, 18 floor plans in which DK and Japanese-style room were consecutive, and 6 floor plans in which DK was independent. There were few cases of independent DK type, and it was only about a quarter of cases in which DK and Western-style room were consecutive. The most common type in 2DK type was the South DK type and continuous Western-style type, and there were 15 cases. On the other hand, in the past study, the most common type was the North DK type and continuous Western-style type, and there were 13 cases respectively. From the above, it is inferred

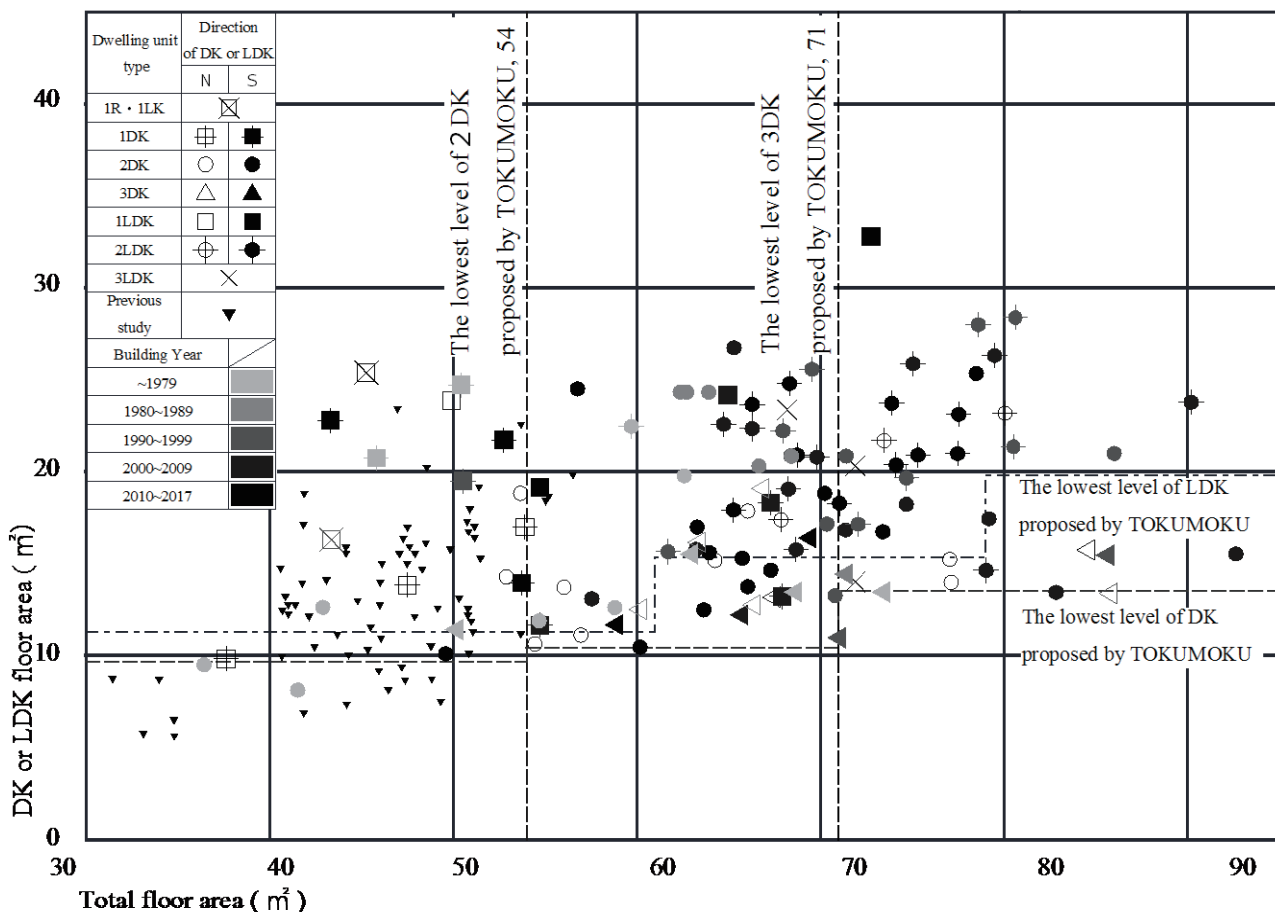


Fig. 2. The relationship between total floor area and DK or LDK area

Table 4. The classification of DK types

		DK type			
dwelling unit type	relation to DK and main room	South DK		North DK	
		Main room — bedroom	Main room — bedroom	Main room — bedroom	Main room — bedroom
2 DK	DK-W	(1)	(2)	(6)	(1)
	DK-J	(3)	(2)	(3)	(2)
	I-DK	(5)	(2)	(1)	
3 DK	DK-W	(1)	(1)	(1)	(3)
	DK-J		(1)	(1)	(1)
	I-DK	(1)	(1)	(1)	(1)

Note DK-W : It shows that DK and Western-style room are consecutive. I-DK : It shows that DK is independent.
 DK-J : It shows that DK and Japanese-style room are consecutive.

Table 5. The classification of LDK types

		LDK type			
dwelling unit type	relation to LDK and main room	South LDK		North LDK	
		Main room — bedroom	Main room — bedroom	Main room — bedroom	Main room — bedroom
L DK	LDK-W	(1)	(10)	(2)	(1)
	LDK-J	(1)	(1)	(1)	(1)
	I-LDK	(1)	(1)	(1)	(1)

Note LDK-W : It shows that LDK and Western-style room are consecutive. I-LDK : It shows that LDK is independent.
 LDK-J : It shows that LDK and Japanese-style room are consecutive.

that South DK increased than North DK and became the basic planning method. Also, because Western-style main room increased, it is considered that the sleeping tool changed from futon to bed.

4.3 Characteristics about LDK type

In the past study, there were 12 cases of 2LDK type. Among them, there was 1 case in which LDK and Western-style room were consecutive, 4 cases in which LDK and Japanese-style room were consecutive, 7 cases in which LDK was independent. The most common is independent LDK type, and there were many cases in which LDK and other rooms were discontinuous. Meanwhile, in this survey, there were 37 cases of 2LDK type. Among them, 34 floor plans were South LDK type, and 3 floor plans were North LDK type. Cases of the South LDK type were more than 10 times the North LDK type. In the past study, there was no description of the direction of LDK, but it is considered that South LDK type is a general way of planning. There were 22 cases in which LDK and Western-style room were consecutive, 12 cases in which LDK and Japanese-style room were consecutive, and 3 cases in which LDK was independent. The most common type was the type of which LDK and the Western-style room were consecutive. LDK type has a higher ratio of increase than DK type. Therefore, it is considered that the demand of LDK type is increasing. Independent DK type decreased, and the type of which LDK and Western-style room were consecutive increased. From the above, it is considered that the lifestyle and the way of using the room is changing.

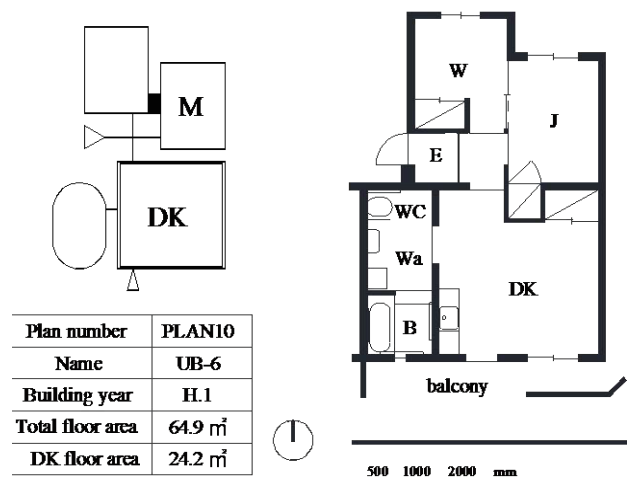
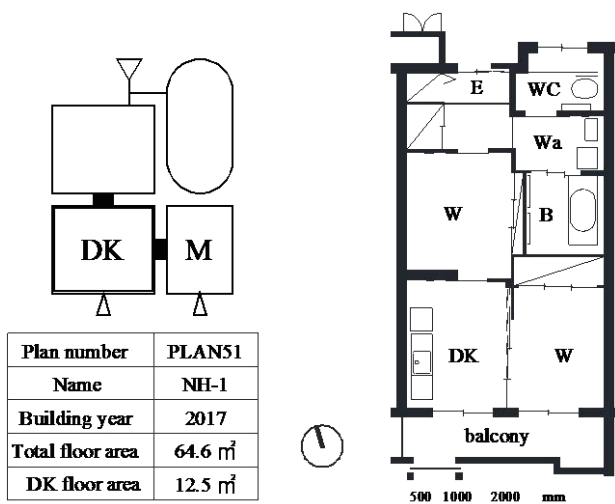
4.4 Characteristics about other type

There were 1R, 1LK, and 1DK, which could not be seen in the past research. 1R type is single room type which has a small kitchen, and 1LK type is a type which has a bedroom, a living room and a kitchen. And, there were 1 case of 1R type, 1 case of 1LK type and 11 cases of 1DK type. Since it was admitted that a single household can live in the public housing only in the case of elderly people or handicapped people by the change of a policy, these types increased. In 1DK type, there were 1 case in which DK was independent and 10 cases in which DK and Western-style room were consecutive. There was no case in which DK and Japanese-style room were consecutive. A Japanese-style room decreased and a Western-style room increased even in other dwelling units of a handicapped household with healthy family members. Not Japanese-style rooms but Western-style rooms where moving with a wheelchair is easy were especially chosen by a single household. There were 5 cases of 1LDK type. Among them, there were 1 case of independent south LDK type and 4 cases of north LDK type. In north LDK type, there were 1 case in which LDK and Japanese-style room were consecutive and 3 cases in which LDK and Western-style room were consecutive.

5. Case analysis

Figure 3 and 4 shows a typical floor plan in the past study and this study.

- (1) Case of 2DK type expanding a bedroom, a sanitary room and a corridor. In this study, Plan 51 is the most general floor plan in DK type (Fig. 3). The average total floor area of 2DK type



Legend

- : Continuity
- : DK or LDK
- : Sanitary room
- : Discontinuity
- M : Main room
- E : Entrance
- B : Bathroom
- ⚡ : Wheelchair accessible
- : bedroom
- WC : WaterCloset
- W : Western-style room
- Wa : Washroom
- J : Japanese-style room

Note This legend of both Fig.3 and Fig. 4.

Fig. 3. Case 1

Fig. 4. Case 2

is 65.9 square meters, and Plan 51 has almost the same area. Since this average is much above the smallest area level proposed in the past study, it can say that living environment has improved. Plan 51 is a common corridor type generally seen by the 2DK type and is located on the first floor with an approach from the north. Moreover, Plan 51 has the storage space of a wheelchair in the entrance, and it is planned as the dwelling for a wheelchair user. The area of DK in Plan 51 is 12.5 square meters. As compared with the past study, the area of DK is standard size, though the total floor area was expanded. That is, it is a type which improves living environment by expanding a bedroom, a sanitary room and a corridor.

(2) Case of 2DK type expanding DK

Plan 10 is the same 2DK type as Plan 51, and the area of Plan 10 at 64.9 square meters is almost the same as Plan 51 (Fig. 4). However, the area of DK in Plan 10 is 24.2 square meters and about double size of Plan 51. On the other hand, two rooms in Plan 10 are narrower than Plan 51, so that it is a type which improves living environment by expanding DK.

6. Conclusions

The findings obtained in this study are as follows.

- 1) The number of self-government bodies which was supplying TOKUMOKU apartment has increased significantly compared to the past research. The number of TOKUMOKU apartments is not affected by the population scale. That is, it is inferred that the number of TOKUMOKU apartments depends on the supply policy of the public housing of each self-governing body.
- 2) In this study as well as the past study, there is more the number of apartments of DK type than LDK type. However, the increase rate in LDK type is larger than DK type, so that it is considered that the family's composition and lifestyle of the resident changed.
- 3) As for area, the total floor area tended to increase compared with the past study, so that it became clear that living environment of TOKUMOKU apartment improved. There are roughly two types of improving living environment. One is a type which improves living environment by expanding DK or LDK, and another is a type which improves living environment by expanding a bedroom, a sanitary room and a corridor.
- 4) In the 2DK and 2LDK type, South DK or LDK increased compared with the past study. Moreover, in the 3DK type, North DK increased more than South DK.

From the above, it was revealed that living environment of TOKUMOKU apartment was improved compared with 40 years ago. However,

because it was gathered only the latest floor plan from each self-governing body in this study, it is necessary to increase the number of floor plans and to investigate how to use TOKUMOKU apartment for the future.

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