The Aspect of Residents’ Evaluation and Community Forming in Planned Detached Housing Areas

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Abstract
The main objective of this paper is to understand the aspect of residents’ community forming in planned detached housing areas, and then is to acquire a method for community planning based on characteristics of a housing area and its residents’ predisposition. For this purpose, an evaluation from the view of residents’ affection was employed. From the residents’ evaluation results and the evaluation structure of affection, the aspect that residents are forming community was clarified. Consequently, it was found that residents’ predisposition about neighbor relations influences the community forming, and some performance criteria and physical elements should be considered as important factors to community planning in planned detached housing areas.

Keywords: community forming; affection; residents’ evaluation; resident’s predisposition; planned detached housing area

Introduction
The term of community is extensively used in various fields at present, and its meanings are very equivocal. Though it is said that social interaction, spatial area and common ties are discovered as the common points among the various meanings, the parts on which emphasis is placed by each type of the researcher are various. Moreover, the required levels and aspects of community are various and changing with region, social state, residents’ predisposition and building type.

Here, I try to comprehend community as a changing concept. In this case, community planning is not to begin with the ideal that conditions will be good, but is to be performed, based on the present state of the concerned area and the degree of the residents’ requirements. From this point of view, the aspect of community forming in planned detached housing areas will be explored.

Recently, through methods such as installing common space in detached housing areas, examples can be seen in Japan of developing which are making an effort to secure quality of residential environment and to improve community consciousness. As a result of the efforts, the plan and design techniques of detached housing areas have been developed. At this point, it will be desirable to consider the actual state of the residents’ evaluation and community forming.

Many studies on planned detached housing areas can be found. For example, several studies focusing on the physical aspect have examined correlation between neighbor relations and common space use (Inui, Kajiura, Fujita and Takahashi 1999), and the influence on the community of the street layout (Saito 2001). Several studies focusing on the non-physical aspect have examined the influence on the community by the residents’ cooperative possession of a specific space (Saito and Yagisawa 1999), and the conditions for promotion of residents’ active management (Inui, Kajiura and Fujita 2000). Some studies have evaluated and analyzed common space in planned detached housing areas (Nishimura, Imai and Kubo 1986; Endoh et al. 1983). These studies are creating good results. What seem to be lacking, however, are studies on the systematic evaluation method and residents’ requirement and degree for community.

The main objective of this paper is to clarify community consciousness and the aspect of the community forming through systematic evaluation, and then to acquire a method of community planning in planning detached housing area.

The Method of Research and Survey
As a first step, planned detached housing areas have been classified into Standard type, Pedestrian passage type, and Square type according the form of the lot division. Standard type means that no common space was planned in a block with ordinary lot division. Pedestrian passage type means that “woonerf” (“street for living”) was planned in a block with lot division. Square type means that a square or pocket garden was planned in a block with lot division. Based on this classification, eight housing areas of research object have been selected (table 1).

A questionnaire was prepared for the residents. The method of performing the questionnaire research was direct interviewing between the researcher and...
respondents. The main contents of the questionnaire are composed with questions of the resident’s attribute, satisfaction and affection for the housing area, 11 performance criteria for the housing area, and affection for 16 physical elements. A question about the motive of neighbor relations is also included. Table 2 indicates the results of residents’ attributes. In the predisposition type of neighbor relations, Independence type means that the resident esteems privacy. Mutual support type means that the resident esteems neighbor relations.

Next, the evaluation results of the residents have been put in order, and an analysis done using the plan condition, the design characteristic, field survey, and the evaluation result in each housing area of study object.

Results of Residents’ Evaluation and Their Review

An outline of residents’ attributes indicates the followings. The tendency with the resident number of years corresponds with the age of the building construction. The rate for the resident number of years in Goshogaoka is high averaging more than 20 years, and Goshogaoka is regarded as being inhabited by many aged people. On neighbor relation type, the rate of Independence type is high in most of the housing areas except Shinseikimura. All respondents in Takezono have the predisposition of Independence type, and Takezono can be called the housing area where residents of Independence type are concentrated.

Figure 1 is the results of satisfaction and affection evaluation for the housing areas. The results indicate that residents are in general satisfied with the level of the residential environment but have a little passive consciousness of affection. Though a wide difference does not occur among the housing areas, the result is highest in order of Pedestrian passage type, Square type, and Standard type. Because the evaluation of the satisfaction is high, I will place emphasis on the aspect of affection from this point and consider it.
Figure 2 is the results of performance evaluation for the housing areas. Physiological comfort is high in all types, and Visual privacy in Standard type is higher than other types, and Esteem for residence in Pedestrian passage type is higher than other types. The evaluation for Originality of outdoor space is good in order of Square type, Pedestrian passage type, and Standard type. According to the type, a difference isn’t seen about Close neighbor relations and Formal neighbor relations. All of housing areas in Square type have cooperative possession space, but the improvement of the neighbor relations by it isn’t seen. Takezono, where all the respondents were independent predisposition type, shows a large difference in Close neighbor relations. Shinseikimura in terms of Responsibility on management shows low evaluation. Through the interviewing with residents, I found that the stronger and more detailed management rules are made in Shinseikimura than other areas. Traffic safety in Standard type isn’t low. In City
Misono and Hill Misono, devices to limit the speed of cars, such as plants box on the side at the road, is planned. However, such devices are not seen in Goshogaoka.

Figure 3 is the evaluation result of the elements that induce affection. A lot of affection elements are seen in the types of pedestrian passage and square. However, Shinseikimura in Pedestrian passage type and Goshogaoka in Square type show a lack of the affection elements. The causes for this can be found, the lack of uniformity in shape and color of buildings and the strong management rule about trees in Shinseikimura, and the decrepit facilities and the square in Goshogaoka where only its function as parking was considered.

The Evaluation Structure of Affection

This section is used to consider what performance criteria and physical elements have an influence on the affection for a planned detached housing area. The evaluation structure of affection will be extracted and used as the basic material to propose the method of the community planning.

How to extract the evaluation structure of affection

Figure 4 expresses a way of extracting evaluation structure. In step 1, making affection of housing area a dependent variable and making 11 performance criteria independent variables, multiple regression analysis is done. Consequently, the performance criteria having an influence on the affection are grasped from the analysis. In step 2, among each performance criterion having an influence on affection and the other performance criteria, the correlation is examined. In step 3, making each performance criterion a dependent variable and making 16 physical elements independent variables, multiple regression analyses are done. And the relations between the dependent variable and independent variables are examined. In step 4, a principal component analysis for affection evaluation of 16 physical elements is done. And the tendency of residents’ evaluation for affection elements is examined and principal components from the analysis are taken. In step 5, making affection of housing area the dependent variable and making principal components about affection elements independent variables, multiple regression analysis is done.

The examination of the validity for extraction results takes the following course. For step 1, 3 and 5, (1) the independent valuables are selected by a stepwise method, (2) the test of the relation structure takes $F$ value (significance level = 0.05), (3) the explanation power of relation structure is confirmed by the multiple correlation coefficient. For step 2, the Pearson correlation coefficients($r$) are examined, among each performance criterion found from analysis of step 1 and the other performance criteria, and performance criteria are selected (only, $r > 0.35$). The correlation coefficients($r$) between the selected performance criteria are written in figure 5 and 6.

Table 3. Main coefficients in step 1, 3 and 5 (for all respondents)

| Step | Dependent variable | Independent valuables and partial regression coefficient | Multiple correlation coefficient |
|------|-------------------|----------------------------------------------------------|--------------------------------|
| 1    | Affection for housing area | visual privacy, 0.314, esteem for residence, 0.305, safety by territory forming, 0.185 | 0.532 |
| 3    | Visual privacy | building method of wall or fence between house and road, 0.247, Abundance of trees and plants, 0.227 | 0.407 |
| 4    | Esteem for residence | road system, 0.231, kind of tree and plant, 0.240, method of lot division, 0.211, access system to house, 0.174 | 0.607 |
| 5    | Affection for housing area | color and shape of exterior wall and roof, 0.359, ‘shape of outdoor spaces in housing area’, 0.270, ‘town scenery by the quantity and kind and maintenance of trees and plants’, 0.244, ‘shape and system and pavement of road’, 0.237 | 0.564 |

Table 4. Principal component scores in step 4(for all respondents)

| Physical elements | P.C. 1 | P.C. 2 | P.C. 3 | P.C. 4 |
|-------------------|--------|--------|--------|--------|
| (1) Access system to house | 0.176 | 0.519 | 0.149 | 0.247 |
| (2) Method of lot division | 0.802 | 0.013 | 0.150 | 0.203 |
| (3) Outdoor scenery seen from house | 0.650 | 0.130 | 0.066 | 0.331 |
| (4) Public garden, trees and plants | 0.612 | 0.310 | 0.465 | 0.102 |
| (5) Abundance of trees and plants | 0.236 | 0.652 | 0.307 | 0.099 |
| (6) Kind of tree and plant | 0.305 | 0.062 | 0.002 | 0.018 |
| (7) Outdoor scenery by maintenance of trees and plants | 0.061 | 0.614 | 0.143 | |
| (8) Road pavement | 0.041 | 0.316 | 0.792 | 0.044 |
| (9) Road system | 0.050 | 0.119 | 0.865 | 0.120 |
| (10) Colors and shapes of house exterior wall | 0.239 | 0.165 | 0.148 | 0.861 |
| (11) Colors and shapes of roof | 0.217 | 0.159 | 0.616 | 0.885 |
| (12) Building method of wall or fence between house and road | 0.550 | 0.377 | 0.280 | 0.130 |
| (13) Town scenery made by private gardens | 0.419 | 0.488 | 0.118 | 0.260 |
| (14) Scenery around vestibule | 0.554 | 0.320 | 0.647 | 0.181 |
| (15) Interval between houses | 0.486 | 0.370 | 0.072 | 0.140 |
| (16) Street furniture | 0.325 | 0.122 | 0.606 | 0.184 |

Table 5. Main coefficients in step 1 (for predisposition)

| Mutual support type | Step | Dependent variable | Independent valuables and partial regression coefficient | Multiple correlation coefficient |
|---------------------|------|-------------------|----------------------------------------------------------|--------------------------------|
| (1) | Affection for housing area | esteem for residence, 0.423, visual privacy, 0.277, Close neighbor relations, 0.237 | 0.652 |
| (2) | Affection for housing area | physiological comfort, 0.333, auditory privacy, 0.271 | 0.489 |

Table 6. Principal components in step 4 (for predisposition)

| Component | Eigenvalue | Proportion | Cumulative proportion |
|-----------|------------|------------|-----------------------|
| 1         | 3.288      | 0.375      | 0.375                 |
| 2         | 2.753      | 0.306      | 0.681                 |
| 3         | 2.604      | 0.300      | 0.981                 |
| 4         | 2.128      | 0.250      | 1.231                 |

Fig.4. Steps of extracting evaluation structure
case divided into two predispositions, Mutual support type and Independence type for neighbor relations. Through the method of extraction and the examination of validity as mentioned above, we can put the evaluation structure of affection in order as shown in figures 5 and 6.

**On the all respondents**

Figure 5 shows how affection in planned detached housing area is formed. Among performance criteria, residents consider Visual privacy, Esteem for residence and Safety by territory important. Among physical elements, residents regard ‘color and shape of exterior wall and roof’, ‘shape of outdoor spaces in housing area’, ‘town scenery by the quantity and kind and maintenance of trees and plants’, and ‘shape and system and pavement of road’ as important.

The figure is explaining the point that Visual privacy is the most important variable. Visual privacy is considerably related with Auditory privacy, and it is thought that the both type of privacy are an important factor for affection forming. The figure also explains that the Visual privacy is affected by the building method of walls or fences and abundance of trees and plants.

In addition, the figure indicates that Esteem for residence is considerably related with originality of outdoor space and is somewhat related with flexibility of outdoor space. Because 4 physical elements that have an affect on Esteem for residence also reflect the shape of the outdoor space, it is possible to say that to give the outdoor space originality and flexibility is an important factor for affection forming.

The figure also indicates that Safety by territory is somewhat related to Traffic safety. For Safety by territory and affection forming, it is possible to say that Traffic safety should be considered.

Moreover, the figure explains the order of importance in the physical elements. The shape and the color of the house are the most important and next in the following order are the elements concerning the outdoor spaces, the trees and plants, and the road.

**On the predisposition of neighbor relations**

Figure 6 shows how affection in a planned detached
housing area is formed according to the predisposition of neighbor relations. Between the Mutual support type, which values neighbor relations, and the Independent type, which values privacy, it is found that many differences exist in the case of affection forming.

First, the affection about Mutual support type is considered. There are not a lot of differences found within all respondents’ evaluation structure. But, in affection of this type, the performance criterion about management is somewhat related with esteem for residence, and an important difference is that Close neighbor relations appeared, though the influence on affection isn’t strong. Figure 6 indicates that Close neighbor relations is somewhat related to Formal neighbor relations.

Secondly, the affection about Independency type is considered. In affection of this type, important performance criteria are Physiological comfort and Auditory privacy. The figure 6 indicates that Auditory privacy is considerably related to Visual privacy.

The Aspect of Community Forming

From the characteristics of housing areas, the results of residents’ evaluation and the evaluation structures of affection, the aspect of community forming in planned detached housing area can be clarified by the followings.

The side of space

It is possible to say that a community is formed after the needs, Visual privacy and Esteem for residence and Safety by territory, are satisfied.

The Visual privacy shows the tendency that is better satisfied in Standard type. The Visual privacy is affected by the quantity of trees and plants and the building method of walls and fences. Shinseikimura, in which Visual privacy was low, shows low evaluation in the building method of walls and fences, and the evaluation items of affection about trees and plants.

The Esteem for residence is related with originality and flexibility of outdoor space. The Esteem for residence is also affected by the physical elements in outdoor space. It is safe to say that community becomes stronger when originality and flexibility of outdoor space increase. The Originality of outdoor space shows the tendency that is high in Square type and Pedestrian passage type.

The Safety by territory shows the tendency that is better satisfied in Square type and Pedestrian passage type. The Safety by territory is related with Traffic safety, and Traffic safety is affected by the system and shape of roads.

As for physical elements, the color and shape of roof and exterior wall have significant influence on the community forming. The shape of outdoor space, town scenery by trees and plants and their maintenance, and the system and pavement of road also influence community forming. For the community forming, housing areas of Square type and Pedestrian passage type have more affection elements than Standard type.

The side of neighbor relations

The residents express a difference of community forming by the predisposition of neighbor relations. For the community forming, the Independent type think much of physiological comfort and privacy in housing area, but the Mutual support type think much of attractive scenery in housing area and appropriate management of outdoor spaces, privacy and neighbor relations.

To gain knowledge for the improvement of the neighbor relations, the residents’ motives that led to form the neighbor relations were considered. Figure 7 indicates that the motive becomes a high occurring frequency in the following:

In Close neighbor relations, that is the order of, (1) through the play among the children, (2) through the work of self-government and management association, (3) through hobbies, circle actives, and pet, (4) through the process of the coop and the cooperation purchase, (5) through the use and cleaning of public spaces.

In Formal neighbor relations, that is the order of, (1) through the work of self-government and management association, (2) through the play among the children, (3) through the use and cleaning of public spaces, (4) through the process of the coop and the cooperation purchase, (5) through hobbies, circle actives, and pets.

From these orders, it is found that two motives, ‘through the play among the children’ and ‘through the...\n
Fig. 7. The residents’ motives about neighbor relations
The side of common values

As the community forming through sharing of a sense of values, the joint management of the housing area can be given. Indeed, figure 6 shows the fact that the condition of the management in housing area is related to the residents’ esteem and that it has an influence on the residents’ affection. Figure 7 also shows the fact that the motive of neighbor relations is visible in ‘through the work of self-government and management association’. All housing areas in the study have management rules like architectural agreement and so on, and it seems that they contribute to form a community.

However, it is possible to be considered not desirable when the management rule is strong and becomes overly detailed. For example, it is making free behavior for satisfying privacy difficult in Shinsekiimura. In addition, the method providing cooperative possession space doesn’t seem to be getting good results. All housing areas of Square type in which the cooperative possession space is given do not show a higher evaluation than the other housing areas for Responsibility on management, and are not higher than the other housing areas for neighbor relations.

Conclusion

In this paper, I clarified the aspects of community forming and the important factors for community planning in planned detached housing areas. The following results can be summarized.

First, when the aspect of community forming is inclusively grasped in the three sides, space, neighbor relations, and common values, it could be seen that the side of space plays an important role in community forming. In addition, it could be seen that the sides of neighbor relations and common values play a role and the effects of interrelation among the three sides also play a role.

Second, the performance criteria of Visual privacy and Esteem for residence and Safety by territory should be importantly considered for community planning on the side of space. For the criteria, housing areas of Square type and Pedestrian passage type are more effective than Standard type. Though the non-physical factors are the most important for community planning on the side of neighbor relations, as the physical factor in support of the non-physical factors, outdoor space for the children’s playing and outdoor space as object of self-government and management association are also important. The method making the strong management rule is not desirable and the method providing cooperative possession space doesn’t seem to be getting good results for community planning on the side of common values.

Third, it was found that the residents’ evaluation structure shows a difference according to predisposition about neighbor relations. Such the difference should be considered in community planning. In Mutual support type, important performance criteria are Esteem for residence and Visual privacy and Close neighbor relations. In Independence type, important performance criteria are Physiological comfort and Auditory privacy.

Fourth, it was possible to contrive useful research method for community planning. I extracted the relative evaluation structure on affection, and could consider reasons for the residents’ affection from the structure. Through such a research method, the practical information for community planning could be proposed.

Based on the aspect of the grasped community forming and the important factors for community planning, we need to propose the more concrete planning method in future studies. Because the needs and degree for community are various, the study of detached housing areas with different characteristics is also necessary.

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