PLACE ATTACHMENT INDEX OF LANDOWNERS IN PANDAAN SUB-DISTRICT, PASURUAN REGENCY, INDONESIA

Gunawan Prayitno*, Dian Dinanti, Safira Aulia Rusmi, Surjono, Dwi Maulidatuz Z.

Urban and Regional Planning Department Faculty of Engineering Universitas Brawijaya, Jl Mayjend Haryono 167, Malang, 65145, Indonesia

*Corresponding author: gunawan_p@ub.ac.id

Abstract. Land-use change occurs alongside the socio-economic, political, social and cultural conditions. Social condition is described as a sense of place or attachment to the place. Attachments to places arise because of changes, conceptualized as emotional links between humans and their environment. The classification of place attachment index indicates the score of three variables on five dimensions which explains the people’s expectation to defend their land. The aim of this study is to determine resident’s opinion about the desire to maintain their land in Pandalan Sub-District using the place attachment index. This index consists of three variables: (1) place identity and place dependence; (2) community context (friend bonding and family bonding); (3) and natural environmental context (natural bonding). The research's result shows the score of variables: the place identity (75.88), place dependence (72.50), family bond (76.82), friend bond (72.82) and nature bond (76.97). All of these scores conclude that the place attachment index is on high class group with the average value is more than 73.33. It means that the residents in Pandalan Sub-District attach great importance of their land and have an emotional connection with their surroundings to maintain the sustainability of their village.

Keywords: family bond, friend bond, place attachment index, place identity, place dependence

1. Introduction

Landuse change will affect the sustainability of land function and it has an impact to the local resident's sense of belonging of their settlement. The sense of place is a framework that provides insights for planners, researchers and communities concerned about the social and psychological impacts of land use change or those who wish to preserve their environment.

The simplest question about place attachment is, "what kind of place is this?" and "what kind of place do I want?". Place attachment can be identified and measured on individual or collective level. it means, the question about "what kind of place is this?" can be explained using the evaluation with the conclusion of being good/bad, important/not important, depend on the meanings of the place. The result of place attachment obtained from the resident's perceive through the direct living experience in their settlement [1].

Place attachment defined as natural, man-made features and living experience which form the meaning and evaluation, encourage the political efforts to protect or release the place (to change the
land). In practical terms, sense of place is part of what a person feels when considering the type of environment and community they want to live or move to. The sense of place also influences the shared ideals of the community which are defined through community planning processes such as a vision and comprehensive land use planning.

Comprehensive planning is expected to solve regional development problems both urban and rural, primarily related to land use change. Land demand is increasing with time from population increase, and also economic and social developments which increase the need for settlements and infrastructure that in turn, encourage land use change[2].

The social condition identified from the place attachment index which describes the resident’s sense of place. Place attachment identifies how the public response about land use change through the concept of relationship between human and the environment [3]–[6]. Place Attachment also describes the sensitivity of the place and the strong positive emotional bonding between the individual and their place [7]. In the society, the attachments can motivate cooperative efforts to improve one’s community [8]. To identify the place attachment index, the research used three variables: (1) place identity and place dependence; (2) community context (friend bonding and family bonding); (3) and natural environmental context (natural bonding) [9].

This research uses place attachment index to determine resident’s opinion about the desire to maintain their land in Pandaan Sub-District. Pandaan is one of sub-district in Malang Regency that has fast economic growth rate. Pandaan is strategic area which is close to Surabaya as a capital city of East Java. Pandaan is also passed by the toll road leading to Surabaya, Malang and Pasuruan, which influence the growth of the rural economy and trigger the land use change. Place attachment index is also used to identify the social condition in Pandaan Sub-District, especially the public opinion about gradual landuse changes in the rural settlement, whether they want to preserve the land or change it.

2. Research Area
Pandaan is a sub-district in Pasuruan Regency which has a rapid land use development, especially on industrial and settlement needs. Land built in Pandaan Sub-District almost dominated while the major livelihood of its population is agriculture. Pandaan Sub-District located near to Surabaya Metropolitan Area (Sidoarjo and Mojokerto Regency) and the capital and also crossed by main way road (by pass road) and highway road (leading to Surabaya and Malang). The previous research on 2017 has shown that the most influential variable toward the landuse change in Pandaan Sub-District is accessibility [10]. It means the areas which is near to Surabaya city and the regional main road have the high possibility to change the land from un-build to build area.

3. Research Method
3.1. Data Collection Method
Data collection method include primary survey and secondary survey, described as follows:

a. Primary Survey
The primary survey includes collecting data through the Place Attachment questionnaire in Pandaan Sub-District. The sample calculation uses a purposive random sampling of the residents (owners of non-built-up land) in Pandaan District. The number of households in Pandaan Sub-District is 30,930 households. Sample calculation use the Slovin formula with errors of 5% as follows:

\[ n = \frac{30,930}{1 + \left(\frac{30,930 \times 0.05^2}{30,930}\right)} \]
\[ n = \frac{1}{1 + (77.325)} \]
\[ n = 395.893 \]

The calculation results are rounded up to 500 respondents with the households distribution in each village based on the area of non-built-up land in Pandaan District.
b. Secondary Survey

Secondary survey is the form of literary studies through government data and research documents. The required data include the number of households and the area of non-built-up land in each village.

3.2. Analysis Technique

The research method use three variables of place attachment index: (1) place identity and place dependency; (2) community context (friend bonding and family bonding); (3) and natural environmental context (natural bonding) [9]. The variables are explained in questionnaire to be assessed by the formula:

$$Index\ Score = \frac{(\%F1 \times 1) + (\%F2 \times 2) + (\%F3 \times 3) + (\%F4 \times 4) + (\%F5 \times 5)}{5}$$

Which is:

- $F_1$ = Frequency of respondents who answered a score of 1 from a question
- $F_2$ = Frequency of respondents who answered a score of 2 from a question
- $F_3$ = Frequency of respondents who answered a score of 3 from a question
- $F_4$ = Frequency of respondents who answered a score of 4 from a question
- $F_5$ = Frequency of respondents who answered a score of 5 from a question

The range of scales from the respondent's answer is also classified into three classes (three box method), with the following range:

| Scale | Score Range | Information |
|-------|-------------|-------------|
| 20    | 46.67       | Low         |
| 46.67 | 73.33       | Medium      |
| 73.33 | 100         | High        |

The score scale is used to classify the average of index value results on each answer indicator in each dimension of variable.

4. Result and Discussion

Pandaan Sub-District grew from the impacts of its proximity to Surabaya Metropolitan Areas and also the economic activities of local residents as they have lived for a long time (long inhabiting period) in Pandaan District. The responses of the landowners about Place Attachment are:

4.1. Place Identity

Place identity has six indicators to assess, which include the following:

| Symbol | Indicator                                                                 |
|--------|---------------------------------------------------------------------------|
| A      | This village means a lot to me                                           |
| B      | I am very attached to this village                                       |
| C      | I have a lot of fond memories about this village                         |
| D      | This village is very special to me                                       |
| E      | I identify strongly with this village                                    |
| F      | I feel this village is a part of me                                      |

Based on place identity indicators, the result of questionnaire shows that the majority of respondents agree with the place identity statement, as evidenced by the high percentage of Agree and Strongly Agree. The respondents mostly chose a score of 4 and 5 (agree and strongly agree) and the recapitulation of the questionnaire of Place Identity Index are as follows:
Table 3. Place Identity Index

| Place Identity | Score Value | Total Score value of indicators |
|----------------|-------------|---------------------------------|
| Indicator A    | 54 86 105   | 975                             |
| Indicator B    | 41 124 138 | 735                             |
| Indicator C    | 53 30 111  | 800                             |
| Indicator D    | 3 30 123   | 965                             |
| Indicator E    | 70 74 108  | 720                             |
| Indicator F    | 79 76 126  | 720                             |

Average values 76.88

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

The average value of place identity is 76.88 which is classified in high. It means that place identity represented by the six questions above is very high in Pandaan District. The respondents as local residents explained that their village has a very precious memories for them and it’s like that their settlement is a part of them which cannot be replaced.

4.2. Nature Bonding

Nature Bonding has five indicators to assess which includes the following:

Table 4. Nature Bonding Indicators

| Symbol | Indicator                                                                 |
|--------|---------------------------------------------------------------------------|
| A      | When I spend time in the natural environment in this village, I feel a deep feeling of oneness with the natural environment |
| B      | I would feel less attached to the this village if the native plants and animals that live here disappeared |
| C      | I learn a lot about myself when spending time in the natural environment in this village |
| D      | I am very attached to the natural environment in this village |
| E      | When I spend time in the natural environment in this village, I feel at peace with myself |

The result explained that the majority of respondents agree to the Nature Bonding statement as evidenced by the high percentage of Agree and Strongly Agree (score 4 and 5). The recapitulation of the questionnaire of Nature Bonding Index are as follows:

Table 5. Nature Bonding Index

| Nature Bonding | Score Value | Total score value of indicators |
|----------------|-------------|---------------------------------|
| Indicator A    | 1 8 174     | 905                             |
| Indicator B    | 55 106 123  | 635                             |
| Indicator C    | 61 114 120  | 720                             |
| Indicator D    | 44 22 171   | 820                             |
| Indicator E    | 68 78 174   | 740                             |

Average values 76.97

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

The average value of Nature Bonding is 76.97 which is classified as high. It means that the local residents have a deep feeling with their natural environment of their precious village.

4.3. Place Dependence

Place Dependence is assessed by five indicators as shown in Table 6. The result shows that the respondents tend to choose agree and strongly agree with the statement of place dependence indicators. The recapitulation of questionnaire are shown in Table 7.

The average value is 72.50 which is classified as Medium class which shows that the local residents get satisfaction to living in their village but it is not the main place for them to work. It means, their village is a important place for settlement but not for working.
Table 6. Place Dependence indicators

| Symbol | Indicator                                                                 |
|--------|---------------------------------------------------------------------------|
| A      | I get more satisfaction out of living in the this village than any other place |
| B      | No other place can compare to the this village                               |
| C      | I would not substitute any other area for the activities I do in the this village |
| D      | Doing my activities in the this village is more important to me than doing them in any other place |
| E      | The village is the best place for the activities I like to do               |

Table 7. Index Place Dependence

| Place Dependence | Score Values | Total score values of indicator |
|------------------|--------------|---------------------------------|
| Indicator A      | 59 82 177 812 690 | 72.8                           |
| Indicator B      | 39 132 222 780 630 | 72.12                          |
| Indicator C      | 43 112 222 788 650 | 72.6                           |
| Indicator D      | 53 88 234 828 590 | 71.72                          |
| Indicator E      | 53 90 198 760 730 | 73.24                          |

Average Values 72.50

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

4.4. Family Bonding

Family Bonding is assessed by two indicators which include the following:

Table 8. Family Bonding Indicators

| Symbol | Indicator                                                                 |
|--------|---------------------------------------------------------------------------|
| A      | I live in the this village because my family is here                      |
| B      | My relationships with family in the this village are very special to me   |

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

The result shows that mostly respondents agree with the Family Bonding statement with the high percentage of respondents who answered agree and strongly agree. The recapitulation of questionnaire are as follows:

Table 9. Family Bonding Index

| Friends Bonding | Score Values | Total score values of Indicators |
|-----------------|--------------|---------------------------------|
| Indicator A     | 52 130 96 524 1100 | 76.08                           |
| Indicator B     | 44 94 84 752 965 | 77.56                           |

Rata-rata nilai 76.82

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

The calculation results of the index show that Family Bonding has a value of 76.82 that is classified as High it means that the local residents tend to stay in their village because near from their family and they have a good relationship among each other.

4.5. Friend Bonding

Friend Bonding is assessed by two indicators which include the following:

Table 10. Friend Bonding Indicators

| Symbol | Indicator                                                                 |
|--------|---------------------------------------------------------------------------|
| A      | The friendships developed through gathering activities in the this village are very important to me |
| B      | The friendships developed through sporting activities in the this village are very important to me |
The result shows that the majority of respondents agree with the Friend Bonding's statement as seen from the high percentage of respondents who answered Agree and Strongly Agree (Table 11). The response recapitulation on Friend Bonding questionnaire in Pandaan District are as follows:

Table 11. Index of Friend Bonding

| Friends Bonding | Score Values | Total score values of Indicators |
|-----------------|--------------|---------------------------------|
| Indicator A     | 45 112 93 788 855 | 75.72                           |
| Indicator B     | 43 160 183 772 590 | 69.92                           |

Rata-rata nilai 72.82

*1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree

The results of the index show that Friend Bonding has a value of 72.82 which is classified as Medium.

4.6. Place Attachment

Place Attachment scoring stage used to conclude the average score of five dimensions (place identity, nature bonding, place dependence, family bonding, and friend bonding) which describe the level of place attachment in Pandaan Sub-District. Based on Table 12, the lowest score of the five dimensions is on place dependence (70.01) and it is caused by the various activities of the respondents which is not only depend on the village activity.

Table 12. Average Score of Place Attachment’s Dimension

| Place Attachment Dimension | Score |
|-----------------------------|-------|
| Place Identity              | 74.31 |
| Nature Bonding              | 72.74 |
| Place Dependence            | 70.01 |
| Family Bonding              | 74.88 |
| Friend Bonding              | 71.93 |

The highest value of place attachment is on family bonding dimension because the most of residents generally applied legacy system by providing the settlement for their family near from each other. The classification of place attachment result are on low, medium and high which is described on each village of Pandaan Sub-District are:

Figure 1 Place Attachment Mapping on Pandaan Sub-District
Figure 1 describes that there are three classes of place attachment score and only pandaan village which is included in the low class of place attachment, five villages are on medium class and 12 villages are have the high score of place attachment. Logically, the 12 villages which are in high class located far from the main road and mostly still have the rural character on agricultural activity. It means that the residents in the high score of place attachment generally are villagers who still focus on agricultural sector and they do not wish to change their land into trading land or anything else. It may be a correlation between place attachment and landowners’ attitude to prevent land use change due to development [4]. However, the villages which is located close to the city and the main road have the medium and low score on place attachment. It means, the local residents still consider to change their land to another function such as trading land to gain the higher income. Regarding to Manzo & Perkin [8] studies where attachment can motivate cooperative efforts among community, our research result is almost the same. The higher value of place attachment motivate inhabitans to preserved their land.

After identifying the place attachment index, further more, another analysis about the possibility of land use change by the land owners in Pandaan District can be identified.

### 4.7. Land Owner Attitude According to the Land Preservation

It is about how the respondent’s attitude on protecting their land and it can be identified using six indicators which include the following:

| Symbol | Indicator |
|--------|-----------|
| A      | Protect ricefield and other natural resources |
| B      | Limit development in open fields and agricultural areas |
| C      | Set aside land for public recreation (i.e., trails, parks) |
| D      | Keep down the costs of town services to new development |
| E      | Keep new residential development low-density (outside the town center) |
| F      | Keep most new development close to/inside the town center(s) |

The result of six variables about the land owner’s opinion on land preservation are as follows:

| Villages      | Respondents Answer (%) | Total |
|---------------|------------------------|-------|
| Pandaan       | 46 21 13 17 4 4       | 4     |
| Kutorejo      | 13 20 4 26 37 15      |       |
| Jogosari      | 22 27 12 27 12 15     |       |
| Petungsari    | 18 18 9 4 51 25       |       |
| Karangjati    | 5 4 2 49 39 30        |       |
| Wedoro        | 1 6 8 55 31 30        |       |
| Tunggalwulung | 6 1 6 26 62 35        |       |
| Sebani        | 8 2 8 50 32 46        |       |
| Kebonwaris    | 7 4 7 49 33 25        |       |
| Banjarsari    | 7 3 8 32 49 25        |       |
| Banjarkjen    | 6 4 4 34 51 30        |       |
| Durensewu     | 14 14 21 38 13 35     |       |
| Plintahan     | 8 16 25 37 14 35      |       |
| Sumbergedang  | 11 12 13 34 30 35     |       |
| Tawangrejo    | 12 8 2 36 42 15       |       |
| Sumberejo     | 12 17 12 31 28 45     |       |
| Keminuewu     | 9 7 5 27 52 30        |       |
| Nogosari      | 10 9 27 29 24 25      |       |

*1. Not Important, 2. A little important, 3. Somewhat important, 4. Quiet important, 5. Extremely important

The result shows that the majority of respondents agree with the Landowner Attitude's statement as identified from the high percentage of respondents who answered Agree (score 4) and Strongly Agree.
(score 5). There are more respondents tend to preserve their existing land use. It is related to the place attachment index which shows that they are highly attached to their place. It means, there are respondents who choose to preserve their existing land use as a rural area with the agricultural activity.

5. Conclusion
The Value of place attachment in Pandaan Sub-District is on the high category as explained by the majority of respondents which expressed on Agree or Strongly Agree. The high value of Place Attachment reflects the high attachment of the local residents to the village environment, both in the natural environment and social environment. Statistic descriptive shows that respondent’s answer of place attachment is positive. It means, the most local people in Pandaan Sub-District have the high level of place attachment to their village. The value of place attachment index shows that the landowners attitude to land preservation is positive. It means, the most landowners in Pandaan Sub-District prefer to maintain the function of the existing land rather than to change their landuse.

Regarding to the inhabiting period, most of the landowners have long lived in Pandaan Sub-District, thus they have a very high level of ties with their environment. It shows there are a relation between inhabiting period and the possibility of a high place attachment. The result explains that the longer period of residents living in their village, the higher attached to their place. The research's result mention the more landowner attached to a place, the more their tendency to preserve their land. This study indicate the positive relationship towards the previous study which is shown by statistic descriptive. As the impact is they more likely preserve existing function of land use. If the condition of the village is still comfortable and the natural resources are well maintained then this shows that the level of place attachment index of the local residents is on the high condition.

References
[1] Stedman R.C. and Kay D.L. 2008. Sense of Place: A framework for Land Use Planning. Research & Policy Brief Series. Issue number 20/August 2008
[2] Siciliano, G. 2012. Urbanization strategies, rural development and land use changes in China: A multiple-level integrated assessment. Land Use Policy 29 (2012) 165–178
[3] Lin, C., & Lockwood, M. (2014). Forms and sources of place attachment: evidence from two protected areas. Geoforum, 74-81.
[4] Lokocza, E., Ryan, R. L., & Sadler, A. J. (2011). Motivations for land protection and stewardship: Exploring place attachment. Landscape and Urban Planning, 99, 65-76.
[5] Raymond, C. M., Brown, G., & Weber, D. (2010). The Measurement of place attachment: Personal, community, and environmental connections. Journal of Environmental Psychology, 422-434.
[6] Jorgensen, B. S., & Stedman, R. C. (2001). Sense of place as an attitude: Lakeshore owners attitudes toward their properties. Journal of Environmental Psychology, 21(3), 233-248.
[7] Stedman, R. C. (2003b). Is it really just a social construction:the contribution of the physical environment to sense of place. Society and Natural Resources, 16(8), 671-685.
[8] Manzo L.C. and Perkin D.D. 2006. Finding Common Ground: The Importance of Place Attachment to Community Participation and Planning. Journal of Planning Literature, Vol. 20, No. 4 (May 2006)
[9] Raymond, C. M., Brown, G., & Weber, D. (2010). The Measurement of place attachment: Personal, community, and environmental connections. Journal of Environmental Psychology, 422-434.
[10] G Prayitno at al. 2018. The factors affecting land use change in Pandaan Sub-District. IOP Conf. Ser.: Earth Environ. Sci. 202 012006.

Acknowledgments
The research is funded by Penelitian Unggulan Perguruan Tinggi Negeri (PUPTN) State University Research Excellence of Fiscal Year 2018, Universitas Brawijaya-DIKTI.