Housing Development on the Urban Fringe and its Challenges to Sustainable Urban Growth

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Abstract. Urban development is one of the substantial factors that shape the quality of human life and its sustainability. However, the intensive growth of housing in the urban fringe seems to threaten this. Meanwhile, the application of spatial design procedures as part of the regulating process has not been successful (Polyzos S., Minetos D., and Niavis S., 2013). Our failure to properly comprehend the phenomenon probably contributes to this failure. Rather than the macro land use approach applied all this time, an intervention in micro land use of the actors may be more effective. Supporting this strategy, this research focuses on the characteristics of housing development on the fringe of Yogyakarta City, although supporting the capability of its people, may potentially threaten the ecological balance and long-term macroeconomic situation of the

1. Introduction

Almost all big cities in Indonesia and middle-sized cities in Java experience spatial developments, sprawling rapidly on their fringes. Observations of cities such as Jakarta, Surabaya, Makassar, Medan, Semarang, and Yogyakarta show that this is a common phenomenon. This infiltration of urban elements on the urban fringe does not only transform land from agriculture into non-agriculture land use but also alters the economic, spatial, and social dimensions [1]. These big cities exhibit at least two phenomena: agglomeration and urban sprawl.

Academic discussions on agglomeration generally focus on the city size and its spatial organization. These discussions affirm that the agglomeration process in western countries is not principally driven by urban sprawl or what is commonly called leapfrog development. Instead, it takes place gradually. This process is induced by rapid population growth and horizontal land use change [2].

Meanwhile, academic discussions on urban sprawl, especially those on cases in developed countries, generally reveal that urban sprawl is promoted by lifestyle [3]. People want to move from crowded and busy urban area to a serene, green, and spacious landscape.

Urban sprawl in developed countries such as the US, Japan, and in Europe does not always form an agglomeration [4]. Thus, the focus of discussions is on transportation and energy [5], as well as the infrastructure network caused by planned clusters in agricultural areas. Therefore, despite the high transportation costs, the value of urban fringe housing is more related to the hedonic attribute of the
property. People enjoy living surrounded by green farmland [6]. Only a few contradict it with the issue of loss of agricultural land.

Is the development of urban fringe housing in the US still motivated by lifestyle? Kirkman in his article “Did Americans Choose Sprawl?” [3] states that until today, sprawl is still trending due to the choices of people in the US, although he says that it is more likely to be the result of piecemeal decisions and consequences, rather than intended or unintended. Regarding the waste of transportation energy and food availability, Kirkman’s later opinion is interesting to be discussed as an issue of the implementation of the sustainable development paradigm. The awareness of sustainable development is generally based on public interest and will take a long time to materialize. Therefore, often it only becomes a study in the public sector, activism, or an academic field. As a result, it has the potential to contradict the nature of sprawl, which is, as Kirkman says, driven by aggregated individual choice, piecemeal, and unintended. It only considers individual profit and most of the time it is short-termed. It tends to ignore bigger issues such as economic stability and ecological sustainability.

How about the experience of cities in Indonesia? What are the driving factors? What is the final shape? What are the non-physical impacts? This article will try to answer these questions by looking at the example of Yogyakarta. To answer these questions, the author has conducted a research to explain 1) the spatial pattern of housing on the urban fringe; 2) the motivations and context/circumstances surrounding it; and 3) place’s influence on the quality of life of new immigrants or the native villagers around the place.

Based on the research findings, this article aims to expose people’s perceptual evaluation, either good or bad, regarding the sprawl of planned clusters on the urban fringe. The last part of this article will discuss the consequences for the direction of future development. It will also describe the challenges of sustainable development and what should be the attitude of public sectors as well as the actions to be taken.

Theoretically, this research attempts to discover whether the paradigm of sustainable development is consistent at the subconscious level of people in general. This can be revealed through a capability survey and public discussion involving stakeholders to bring out their awareness level. For the planning practice, this exposure provides a map for the things that are invisible on the surface, but latent and existing in people’s subconscious mind.

The prospect of sustainability depends on the collaboration and participation of stakeholders. It goes along with the argument that stakeholder collaboration and participation, social sustainability, and continuous development are intertwined and together can contribute to social change [7]. Meanwhile, according to Arnstein, only genuine participation that safeguards stakeholders’ needs is effective and is contextual to their problems and aspirations [8]. The problem Arnstein mentions is not fully resolvable and is still relevant nowadays as can be seen from the sustainable development goals that focus on addressing interlinked human needs. The problem is that local regulatory measures and instruments fail to transpose people’s aspiration as ‘half’ of the concept of sustainable development [9]. That said, it is not easy, even for stakeholders, to recognize the real needs and problems, particularly the long-term ones. The reason is perhaps that stakeholders do not automatically consider the needs involving long-term communal interests, such as food security and sovereignty - that serve as of the core of sustainable development. As Kirkman says, currently, the unintended processes are relevant for sustainable development [3]. This research confirms that people’s decision to sprawl brings a dilemma to sustainable development.

The consensus is that sustainable development [10] comprehensively and proportionally serves the growth of economic wellbeing in fairness to all communities and involves the harmony of social interaction, and the protection of the environment. Practically, the important core of this concept is the protection of the sustainability of well-being itself – including the sustainability of food security and the quality of amenities - and the sustainability of energy resource due to the wise use of it. Therefore, human civilization will continue to improve. To achieve this, every human action must be done in awareness. This is why it is important to understand the reason behind every phenomenon of civil development - including sprawl - from the view of people’s subconscious mind. Understanding it may
produce some considerations for public policies. It can direct people’s decisions including the choice for living space and finally, it will result in the development of sustainable settlements.

The development of housing on the urban fringe can be studied from the perspective of sustainable development by evaluating the spatial pattern and its effects upon people’s capability and wellbeing, not only in the short but also in the long term.

2. Method
The spatial pattern on the urban fringe can be revealed based on the macro observation of the growth of newly planned clusters in the southern part of Yogyakarta, using both secondary data and direct observations (i.e., grand tour). For a more precise scale, the data are gathered from a random sampling of 50 out of 275 clusters in the surveyed area. To find out their motivations, the inhabitants of clusters and the villages around them were asked to answer some questionnaires. The objective is to find out the reason for living in that area and to understand the background and the process of land use transformation.

A capability survey [11] using closed questionnaires was applied to describe the influence of the place on people’s lives. In addition, the survey can reveal whether the elements of place serve as positive or negative assets for its people or the city/region in general. The categorization of positive and negative assets can be the basis of the analysis of the advantages and disadvantages of planned cluster development in the green area of the urban fringe.

In the framework of the capability survey, the Community’s Capabilities Index (Cci) scale is prepared as an instrument to indicate the quantitative level of well-being, which is basically abstract and relative in nature. The data can also be used to measure the level of a place’s supporting capacity and in this context is called Place’s Capability Supporting Index (Pcsi). This index measures the conformity of a place in facilitating the creation of opportunities to choose and perform a variety of functions wanted by the inhabitant (capability level). Used jointly with data of quantitative assets or transferable commodities, Pcsi can function as the coefficient of wealth multiplier or deflator. The coefficient is determined by the proportion of Pcsi in defining Cci.

Considering the dichotomy of good-bad and helpful-constraining, the capability level index can be translated as a vector with two directions. Its tendency toward ‘helpful’ perception is represented by a positive number and ‘constraining’ by a negative (see [12]) for a similar research). For this purpose, a scoring technique is applied to convert the scale of people’s perceptual evaluation. A range between -2 to 2 is proposed for this need. The objective is to simplify the calculation and the interpretation of questionnaires into some calculation index. A difference of one point in each option is expected to still reflect the contrast of people’s evaluation regarding the availability and accessibility of an asset. It can be done by giving a score of 2 for the answer of ‘better’, and -2 for ‘worse’ and ‘0’ for ‘not so much different’ (no changes). Zero can also mean the asset is not possessed/not accessible/not perceived by the respondents. The scale of -2 to 2 is also used to measure the scale of people’s perception in evaluating the level of opportunity offered by the asset. A score of 2 means the asset is very helpful, 1 means helpful, -1 means constraining, and -2 very constraining (see table 6.2). The general outline of the questionnaires is shown in table 1, whereas the whole variety of assets and the formulas of CI, Pcsi, and Place’s coefficient (multiplier or deflator) can be found in table 7.
Table 1. Questionnaires Design as Capability Survey Tools.

| No | Assets | Components/Assets | Availability |
|----|--------|-------------------|--------------|
|    |        |                   | Better       |
|    |        |                   | Not So Much  |
|    |        |                   | Different to |
|    |        |                   | previous/No  |
|    |        |                   | Improving    |
|    |        |                   | Not Exist/   |
|    |        |                   | Not Accessible/|
|    |        |                   | Unfavorable  |
|    |        |                   | Worse        |
|    |        |                   | Very Helpfull|
|    |        |                   | Helpfull     |
|    |        |                   | Unclear      |
|    |        |                   | Influences   |
|    |        |                   | Constraining |
|    |        |                   | Very Constraining |
|    | Score  |                   | 2            |
| 1  | Space/land to reside | 1 | 0 | -2 | 2 | 1 | 0 | -1 | -2 |
| 2  | Space/land for business/temning | 2 |
|    | Transportations cost | 40 |

The capability questionnaires were disseminated in September 2017. The typology of opinions and the evaluation of the respondents gathered from the capability survey can also give initial information regarding people’s preferences. It can indicate the trends that may take place in a long run; whether people will drive or correct the ongoing development pattern. Correlated with common attitudes of the government and other stakeholders (property developers and environmental activists) obtained from the FGD results, it will provide a description on how hard or how easy the urban growth management is on this phenomenon.

3. Results

3.1. The Speed of Development toward the Urban Fringe
Yogyakarta City experiences relatively rapid development. Based on the research conducted by Bappeda Yogyakarta in 2015, for three decades, the urban built-up area has grown 1.1% from 1990 to 1995, almost reaching 5% from 2005 to 2000. The built-up area in 2000 is seven times larger than in 1995. Although the growth rate has been slowing down since 2000 at 3.3%, the additional built-up areas are still huge, increasing from about 5600 ha in 2000 to 9000 ha in 2010. Recently, the radius of agglomerated urban housing is around 12 km. If we count in leapfrog housing clusters, the radius has reached 18 km (see figure 1).
An intensive research is conducted in Bantul Regency in the southern part of Yogyakarta’s urban agglomeration. This part of the city has grown quite rapidly in the second period of urban fringe development. As seen in figure 1, the first phase was around 1990-1995 and took place in the northern part (Sleman Regency). In Sleman, the growth was driven by the concentration of major universities such as UGM, UNY, Atmajaya, UPN, UII, Universitas Sanata Dharma, UKDW, and many other academies or other high education institutions. The growth in the southern part is probably caused by the immensely high price of land in the northern part of Yogyakarta. Land large enough to develop clustered housing is more and more difficult to find in this area.

The population of Bantul is around 955,015 with 2% population growth during the last 5 years. The average population density is 1,884 people/km². However, the highest concentration lies in the districts adjacent to Yogyakarta such as Kasihan, Banguntapan, and Sewon. The population density in those districts may reach up to 2766 people/ha.

**Figure 1.** Agglomeration Spatial Development in Urban Areas of Yogyakarta 1995-2010. Source: Bappeda DIY, 2015
Figure 2. The distribution of newly planned clusters in Bantul Regency.

Based on the data from Bappeda, from about 2005 up to 2015 275 planned clusters applied for permits and were finally developed in Bantul Regency. The details are outlined in Table 1 and its distribution is presented in Figure 2.

Table 2. Data on the cluster development in Bantul Regency.

| Year | <2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|-------|------|------|------|------|------|
| Cluster Units | 170 | 23 | 15 | 29 | 18 | 20 |

Based on direct observations, it can be seen that some points around the new clusters, as outlined in the map, rapidly turn into urbanization-triggering spots. The urban atmosphere marked by the small and dense housing and the non-agricultural population is getting stronger; slowly these clusters merge with native villages and form a bigger economic agglomeration.

3.2. Reasons behind Location Choice

Based on the questionnaires distributed to 110 respondents, the profile of people in the Bantul urban fringe can be mapped out. The respondents consist for 33.6% of immigrants, 94.6% of them come from the same province and 5.7% from outside the province. Among the immigrants coming from the same province, only 11.4% comes from Bantul; the rest comes from other regencies, mainly Yogyakarta city and Sleman. Most of them (70.2%) have purchased and own the land, 13.5% lease land, and 2.7% got it as a grant, while the rest does not mention the origin and the status of their houses. The main motivations of immigrants to move in this area are:

Table 3. Reasons to migrate to urban fringe in Bantul.

| Motivation             | Answer (%) |
|------------------------|------------|
| Reasonable Price       | 45         | 40.91      |
| Near Campuses          | 24         | 21.82      |
| Near Working Places    | 15         | 13.64      |
| Strategic Location     | 11         | 10.00      |
| Comfortable Place      | 11         | 10.00      |
| Good Accessibility     | 3          | 3.64       |
|                        |            | 100.00     |
3.3. Motivations for Releasing Land
As mentioned above, 70.2% of the inhabitants are immigrants who acquired their houses by buying them. Some of the respondents (45.9%) are buyers; 21.6% are sellers, while 5.4% have sold and bought as well. The interesting thing is that 24.3% of them often act as a broker.

The subsequent data reveals that 72% of the lands bought by either big developers, small developers, or by private individuals were previously farmlands, and only 11% were empty land ready for building a house on. Data from the government confirm that the conversion rate from farming land into housing is 40 ha per year.

To find out the background of the sale of land, particularly the ones that are previously farms, a further interview was conducted upon the 27% of respondents who stated that they had sold their land. The interviews were conducted using open questions, i.e., asking the respondents to mention their reasons for selling their land. They were encouraged to give more than one answer considering that there are possibly several reasons behind the decision to sell the land. Grouped based on similarity, the types and the frequency of the answers are tabulated as seen in the table below.

| Reasons                                                                 | Percentage of being mentioned |
|------------------------------------------------------------------------|------------------------------|
| There is an urgent need (sickness, paying tuition fee, finding a job for  | 80.0                         |
| the children, and making a house for the children).                    |                              |
| Highly increasing price of land                                       | 77.5                         |
| There is no one to take care it of                                    | 60.8                         |
| To be bestowed as inheritance in the form of money                    | 45.8                         |
| Too small to be cultivated                                            | 44.2                         |
| Not so fertile, no irrigation facilities                              | 22.5                         |
| To buy another farm in another location (farther, but larger)          | 11.7                         |

The data in table 5 above affirms that the key motivation for people to sell their land is a combination between economic deprivation and lack of government incentives in the agricultural sector to push the productivity and economically beneficial scale of farming. The high prices offered for the land also add to this motive.

3.4. Physical Organization of Urban Fringe Housing
Most the respondents’ houses (85.83%), owned by both immigrants and native villagers, are one-story buildings on plots of 100-200 m² of land. A few of them (23.33%) are bigger (more than 500 m²) and the rest is between these two categories. A deeper study upon the answers shows that the bigger plots are owned by the natives. It can be concluded that 100 m² to 200 m² is the optimum size compromising between the standard minimum need of living space and affordability of the buyers.

As previously mentioned, most of the cluster locations were previously farmland. Therefore, it is natural that the three sides of the 81% clusters are bordered by a farm, a yard, and a village. Meanwhile, 14% of the clusters are bordered by other new planned clusters, and 5% are developed on previously occupied land. Generally (86%) the new clusters are fenced around; only 14% are not and are adjacent to a yard or merged with an old village area. One cluster is usually not correlated to other clusters as one unit of housing. For example, 3% of clusters share common streets, while 14% are adjacent but have their own street access. The most dominant (83%) are clusters located far apart. These facts affirm that the development has a sprawling and leapfrog pattern. On the other side, only a few clusters are developed by an infill method, i.e., developing a cluster in an empty land ready to be built on so it fills in the area instead of opening up a farmland.

Although most clusters are developed on farmland, the majority (78%) is developed without new access roads. Only 22% clusters build their own roads and at least 5% do not build any roads and use
the existing roads around the village. Meanwhile, 21% use some trail in the farms called farming paths which are actually intended to facilitate farming sectors. Some clusters (47%) release the farm on the sides of primary collector (provincial) roads or secondary collector (district) roads and 3% release the farm on the sides of primary artery (national) roads.

Survey result shows that the government control over productive land for farming is so weak that they can barely protect it. The government is practically absent in managing physical order to form a physically integrated neighborhood. As a result, the development of the new clusters commonly puts an additional burden on the existing infrastructure in the urban fringe.

3.5. Quality of Life of Urban Fringe Residents

Based on the respondents’ answers regarding their perceptual evaluation on the proposed 40 assets, the Capability Index (CI) for both communities – in the native villages and in the newly planned clusters – is quite good. They are 0.32 for the village community and 0.40 for the residents of the new clusters. According to their evaluation on their scale of happiness (between 1 to 10, 1 for very unhappy and 10 for very happy) regarding the condition of the asset in question, the rate of their happiness is also good; 7.43 and 7.63 for villagers and residents of new clusters respectively. Keeping in mind that capability is the level of freedom from the inadequacy to fulfill their needs and the freedom to choose, this CI level indicates that people in the research area is quite prosperous (1 means perfect capability, -1 means the most helpless, and 0 is the lowest limit of the capability to fulfill living standard). This condition may correlate with the expression of happiness which is a direct expression based on the experience of all respondents.

Place’s components formed by Tangible Public Assets, Social Institutional Assets, and Economic Institutional Assets synchronically contribute a great deal to people’s capability. This is confirmed by the Place’s Capability Supporting Index (Pcsi) which is relatively high (0.35 for the village and 0.41 for the planned clusters). Even, if the place’s coefficients for both communities are taken into account, the place’s assets can function as a multiplier of their capability. The value is 13.01 for the villagers and 37.71 for the immigrants. It means places have multiplied the values for them.

Table 5. Indicators of happiness, capability and their factors.

| Variable                                      | Formula   | Village | Planned Cluster |
|-----------------------------------------------|-----------|---------|-----------------|
| Happiness Score (H)                          | Average   | 7.43    | 7.63            |
| Assets Availability (A)                      | Average   | 1.08    | 1.26            |
| Assets Function (F)                          | Average   | 1.55    | 1.59            |
| Capability Index (CI)                        | \((\text{AxF})/8\) | 0.32    | 0.40            |
| Average Score of PTA, SIA, EIA Availability (Ap) | Average   | 1.06    | 1.23            |
| Average Score of PTA, SIA, EIA Function (Fp) | Average   | 1.62    | 1.63            |
| Place’s Capability Supporting Index (Pcsi)   | \((\text{ApxFp})/8\) | 0.35    | 0.41            |
| Place’ Coefficient (Multiplier/deflator)     | \(\text{Pcsi/ABS(Pcsi-Ci)}\) | 13.01   | 37.71           |

The data in table 6 indicates that both villagers and the new residents perceive and feel that the development of planned clusters in this area as a living place is quite profitable. However, taking a look at every group’s asset forming the Place’s Asset, we can see quite a conspicuous notion, particularly in the variable of assets coefficient in the groups of Economic Institutional Assets and Social Institutional Assets. Although the values are always positive in both communities (the EIA value can even serve the multiplier up to 4.22 for the villagers and 2.66 for the immigrants), it contradicts the development of public infrastructure in the group of Public Tangible Asset. The score for this is only 0.32 for villagers
and 0.54 for the immigrants. The value below 1 means that infrastructure is the deflator for the assets and people’s capability.

Table 6. The Roles of Place’s Assets Class to Support Capability.

| Assets Class                          | Village | Planned Cluster |
|---------------------------------------|---------|-----------------|
| Tangible Public Assets (Infrastructure) | 0.29    | 0.76            |
| Social Institutional Assets (Social capital) | 1.50    | 1.73            |
| Economic Institutional Assets         | 1.38    | 2.66            |

Table 7. Average Perceptual Evaluation Score on Assets.

| Category                 | No Assets | Components/ Assets | Tangible Individual Asset | Tangible Public Asset |
|--------------------------|-----------|--------------------|--------------------------|-----------------------|
| 1                        | 1         | Space/ Land to reside | 1.13                     | -1.27                 |
| 2                        | 2         | Space/ Land for business farming | 1.43                     | -0.27                 |
| 3                        | 3         | Owning transportation means (bikes, motorbikes, car) | 1.07                     | -1.27                 |
| 4                        | 4         | Owning communication means (telephones, cell phone) | 1.10                     | -1.27                 |
| 5                        | 5         | Owning devices to access information (newspaper, magazines, radio, TV, and internet) | 1.70                     | -1.27                 |
| 6                        | 6         | Income/ Daily needs fulfillment | 1.73                     | -1.27                 |
| 7                        | 7         | Savings            | 1.87                     | -1.27                 |

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| Category                  | No Assets | Assets Components/ Assets | Kampong | Planned Cluster |
|---------------------------|-----------|---------------------------|---------|-----------------|
|                           |           |                           | Score of Asset Class Availability | Score of Asset Class Function | Score of Asset Class Availability | Score of Asset Class Function |
| Government/ community     | 12        | readiness for disaster    | 0.80    | 1.00            | 1.07            | 1.60            |
| management/ freedom from  |           | disaster                  |         |                 |                 |                 |
| Availability of education | 13        | facilities                | 1.73    | 1.90            | 1.87            | 2.00            |
| facilities                | 14        |                           | 1.47    | 1.97            | 1.80            | 2.00            |
| Availability of           | 15        | market facilities         | 1.20    | 1.40            | 1.27            | 1.57            |
| Easy access to clean      | 16        | water                     | 0.33    | 1.13            | 0.40            | 1.07            |
| water                     | 17        |                           | 0.33    | 0.73            | 0.33            | 0.77            |
| Availability of           | 18        | recreation facilities     | -0.13   | 1.23            | -0.20           | 1.27            |
| public library            | 19        |                           | 0.07    | 1.00            | 0.13            | 1.47            |
| Individual Intangible     |           |                           |         |                 |                 |                 |
| Assets                    | 20        | Level of people’s education | 1.57    | 2.00            | 2.00            | 1.87            |
| Assets                    | 21        | Quality of people’s health | 1.90    | 2.00            | 2.00            | 1.93            |
| Capability in speaking    | 22        | foreign language          | 1.20    | 1.15            | 1.36            | 1.42            |
| Ability in speaking       |           |                           |         |                 |                 |                 |
| foreign language          | 23        | Creativity and innovation | 1.10    | 1.17            | 1.30            | 1.37            |
| of goods/ services        | 24        | People’s fighting spirit  | 1.07    | 1.33            | 1.77            | 1.73            |
| to get a better life      |           |                           |         |                 |                 |                 |
| Social Intangible         | 25        | Kinship/ Social/ Cultural | 1.53    | 2.00            | 2.00            | 1.87            |
| Assets                    | 26        | organization              | 1.47    | 2.00            | 2.00            | 2.00            |
| Cooperation by numbers    | 27        | of community               | 1.50    | 2.00            | 2.00            | 1.94            |
| regarding social, cultural, |           | and economic matters      |         |                 |                 |                 |
| and economic matters      | 28        | Solidarity                | 1.50    | 2.00            | 2.00            | 1.88            |
| The existence of          | 29        | discussion forum          | 1.50    | 2.00            | 2.00            | 1.97            |
| Economic Institutional    | 30        | Easy access to get bank   | 1.03    | 1.60            | 1.10            | 1.40            |
| Assets                    | 31        | credit, etc.              | 1.57    | 1.70            | 1.13            | 1.47            |
| Opportunity to start      | 32        | business                  | 1.63    | 1.77            | 1.13            | 1.40            |
| business                  | 33        | Easy to get daily         | 1.97    | 1.93            | 1.47            | 1.70            |
| consumption goods         | 34        | Easy to get raw           | 0.07    | 0.77            | 0.53            | 0.90            |
| material                  | 35        | Easy to market            | 0.80    | 0.90            | 0.53            | 1.03            |
| products                  | 36        | Opportunity to get government assistance/ subsis for health, education or business | 0.80 | 1.38 | 0.90 | 1.56 | 0.53 | 1.03 | 1.49 |
| Economic Institutional    |           |                           |         |                 |                 |                 |
| Assets                    | 37        | Easy access to get health insurance | 1.60 | 1.70 | 1.47 | 1.70 |
| Assets                    | 38        | Capability to pay education fee | 1.87 | 1.97 | 1.98 | 1.97 |
| Assets                    | 39        | Capability to buy/ get/ rent a house | 1.67 | 1.83 | 1.67 | 1.73 |
| Assets                    | 40        | Transportation cost        | 1.00    | 1.03            | -1.57           | 1.00            |
| Average                   |           |                           | 1.08    | 1.55            | 1.26            | 1.59            |
The capability survey indicates that, in general, both the immigrant and the natives feel that the developments on the urban fringe benefit them. Only in some sectors people think that this development causes them setbacks and even so they believe this is overcome by infrastructure enhancement by the government. However, it is important to note that this capability survey is basically people’s evaluation based on their experience of the past and present situation because principally people can only evaluate things based on their past experiences. However, this evaluation result is quite useful because it provides information regarding people’s preference that can be utilized to predict their attitude toward the options of development direction offered by the government. In line with their function, the government, through the public planning board, must not merely follow people’s preference, but also has to direct their choices to compromise between short-term needs and safeguard the well-being in the future. In fact, the main role of the government is to manage sustainable development.

3.6. Cost and Benefits Indications & Growth Management Challenges

The analysis of the perceptual data shows that the development of newly planned clusters in the urban fringe area is felt to provide positive changes in terms of the formation of social assets and economic institutional assets for the respondents. It is probably related to the process of magnification of housing scale that also enlarges the scale of people’s economic activities. Regarding the social institutional asset, the immigrants feel a higher increase, but it is the native villagers who feel the higher benefits of it. In general, the changes in social and economic aspects have been considered to increase the people’s capability and well-being. However, in general, it can be said that both the immigrants and the natives feel happy about this development. It is also indicated by the expressed happiness level in relation to the previously evaluated asset conditions.

One of the negative aspects of this that respondents see is particularly related to transportation, even for the immigrants. It is not only about the availability of the facilities, but also about the costs. Meanwhile for the natives, the negative aspect they strongly perceive is the downgrade of farmland productivity/quality. Regarding how insufficient public infrastructure (public tangible aspect) support is, people think it is more about the phase of development that is not yet to come. The government has not implemented it because it is still in the initial phase. Therefore, the unavailability of infrastructure is not regarded as a loss at this point.

The respondent’s answers to the capability questionnaires only represent the individual interests. To reveal the advantages and disadvantages of this development more comprehensively, a Focus Group Discussion with stakeholder groups is necessary. One FGD meeting was held a few months before the capability survey, in January 2017 in office of the Regional Planning and Development Body (Bappeda) of Bantul and was attended by the staff of Bappeda, the Human Settlement Department and the Water Resource Department of the Office of Public Works, the Agricultural Office, the National Land Agency, the representatives of Indonesian Real Estates Yogyakarta (REI), heads of districts, and heads of villages. Based on this FGD, the potential advantages and disadvantages of this development and the stakeholders’ attitude can be categorized.

The Agricultural Office, the Water Resource Department of the Office of Public Works, and local officials (heads of the districts and villages) tend to view the development of the planned clusters in their area as a disadvantage. The Agricultural Office is concerned about the loss of farmland in the Bantul area. According to their data, the rate of land transformation in Bantul is up to 40 ha per year. Meanwhile, this regency bears a duty from the Provincial Government to provide as much as 13,000 ha of sustainable farmland as the implementation of Law UU no 41/2009 regarding Protection of Sustainable Farm Land which has been followed up by Regional Regulation no 1/2011. The Agricultural Office argues that even without this duty, the loss of farmland can cause high prices of rice and other commodities in the future. Aside from that, they are concerned with the future ineffectiveness of the irrigation function. Meanwhile, the investment in irrigation and its maintenance is quite costly. The Water Resource Department of the Office of Public Works shares these concerns.
The heads of the districts and villages see the negative impacts of planned clusters development in their area in regard to the decline in supporting capacity of infrastructures, such as roads, drainage, and cemeteries. In their opinion, the growth of newly planned clusters will cause traffic congestion both in the villages and the collector roads connecting this area with downtown areas.

On the other hand, Bappeda and REI are in dilemma. Bappeda sees this growth as a generator of regional economic development, but on the other hand, they also see threats to farm sustainability. REI finds that they can only develop planned clusters in this type of area where farmland is still abundant because the land in urban areas is far too expensive. They state that in the last 5 years, it was still possible for them to find a land of IDR 500,000 to 1,000,000 per meter square in this area (around 36 USD to 73 USD per meter square), whereas it is very difficult to find such land under IDR 3 million (around 220 USD) in the agglomerated northern part of the city or in the town center. Farmland is much more affordable; in the same area, farmland costs only half or at most 2/3 of dry agricultural land. Farmland vast enough to develop an extensive cluster is also easier to acquire.

At the end of the FGD, there was a tendency by the participants to find a compromise for this problem. Their idea is to push housing investment in this area using the “infill” method, of developing clusters on dry agricultural land ready to build on and integrated it with the old villages. It should be also accompanied by investment collaboration to increase the supporting capacity of jointly utilized infrastructure. In addition, large-scale planned cluster development is only allowed on unoccupied land that, according to physical analysis, is not fertile or equipped with irrigation facilities and other agricultural infrastructure. This idea is quite interesting; however, all participants know how hard it is to implement.

4. Lessons Learnt, Policy and Theoretical Implication

Using the framework of the capability survey, this research discloses the impacts experienced by the community, from the perspective of both the immigrants and the natives. In general, people feel that the development of planned clusters is beneficial. However, the impacts are short-term. Indeed, human’s subconscious mind can only assess what it has experienced and is experiencing. The long-term significance that humans think about usually concerns their descendants as reflected in the survey regarding education.

Only the experiences that people have gone through or are going through in their life can underlie most of their actions throughout their life. Regarding long-term interest – particularly the ones unrelated to the well-being of people’s descendants – only the public sector can take care of it. The government staff in the public sector is concerned especially when it is their duty by law. For instance, in this case, the staff of the agricultural department is concerned with farm sustainability because it is an obligation under Law No. 41/2009 and Government Regulation No. 1/2011 regarding Establishment and Transformation of Sustainable Farm Land. The staff of the Water Resource Department of the Public Work Office feels responsible for the economic benefits of the irrigation channels they have built.

The above condition implies that a long-term interest as an essential principle of sustainable development must be institutionalized and campaigned to be the part of public awareness. The campaign should start with some issues people face directly, for instance, transportation costs and farmland fertility. Both of them are evaluated as getting worse in the capability survey. People should know the long-term consequence, for example by seeing cost projections. They should realize that their choices will not only affect them and their family but also the wider economy and ecology. They can see it through cost-and-benefit calculations that include the direct and indirect cost in a long run. The approach of monetary valuation such as the increase of food price due to the loss of farmland and the energy scarcity due to overuse will probably be easier to be comprehended by the community. This consciousness also growing in American thought. Atkinson and Ted Oleson [13] summarized that the costs of sprawl are becoming widely recognized across the social spectrum in the US. They note that in 1995, the Bank of America, the Resources Agency of California, the Greenbelt Alliance, and the Low-Income Housing Fund teamed up to produce a report titled "Beyond Sprawl: New Patterns to Fit the New California", which shows the costs of sprawl to taxpayers, businesses, suburban and central city
residents, farmers, and the environment. The final report shows that continued economic development due to urban sprawl is not sustainable.

This research shows a gap between development concepts, especially the ones influencing the future, in the mind of public planner and people’s “daily” decisions. It is rooted in the absence of methods and operational indicators that can bridge people’s opinion dominated by their needs and present well-being and the government’s responsibility to assure the sustainability of long-term improvement of the quality of life.

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