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# THE IMPORTANCE OF PENTA-HELIX COLLABORATION ON SUSTAINABLE HOUSING DEVELOPMENT FOR LOW-INCOME COMMUNITIES IN INDONESIA

**Mahelan Prabantarikso, Idqan Fahmi, Anas Miftah Fauzi, Nunung Nuryartono**

***Abstract:*** The importance of Sustainable Housing in Sustainable Development cannot be omitted by the government of Indonesia to fulfill the well-being of the people, particularly for the low-income group in the society.

The collaboration among stakeholder is necessary to implement the Sustainable Housing Development. While there are evolutionary processes on the discourse of stakeholder model of strategic collaboration, *Penta-helix model* is believed as an integrated approach to implement Sustainable Housing.

By using literature study on both empirical and theoretical analysis, combined with practical evidences, this paper attempts to reveal that strategic collaboration between Business Sectors with Government, Academics, Community, and Non Government Organization ensure the successful project of Sustainable Housing Development.

***Keywords:*** Sustainable Housing, Stakeholder Collaboration, Penta-helix

## INTRODUCTION

Sustainable Housing (SH) underscores the importance of considering social and ecological factors, apart from economic factors in housing development. In the discourse of housing development, the implementation of SH in housing development would not only provide people with housing, but it will give a major impact on health and well-being (Ilensanmi & Ogunshakin 2010).

SH also adopts the fifth principle of the United Nations'Conference Declaration for Human Environment, which states that '(Housing) Planning must be applied to human settlements and urbanisation, whith a view to avoiding adverse effects on the environment and obtaining the maximum of social, economic and environmental benefits for all (UNEP 1997). Similarly, the Europa Union underscores the importance to use SH approach, in which, housing development should incorporate the principles of 'material durability', affordability and psychological impacts and eco-efficienty.

It is not surprising if the government of Indonesia has made a housing policy which accommodated the SH approach. Since 1997, the Ministry of Life Environment has stated that the future of housing development should be part of the national policy to create healthy environments, viable economy, socio-cultural sensitive to achieve well being of the society as a whole. Integrated policy on housing, which accommodate economy, social, and ecological factors should be supported. (Hilman 2008).

Earlier researches have been done on the discourse of SH. Winston & Eastaway (2008) have elaborated the concept of SH and some key indicators to be implemented in SH development. Mulliner & Maliene (2011, 2015) have also introduced the SH criteria should not only accommodates 'housing affordability' factor, but also the environmental and social factors. Moreover, the study by Prochorskaite & Maliene (2013) concluded that SH impacts significantly to health and well being of the society.

Although SH approach has been promoted by the government of Indonesia, less researches have been done on the discourse of SH, particularly with the implementation of SH and how stakeholders in SH should involve in the implementation. For instance, Earlier research by Larasati (2006) have evaluated some SH programs in four different places in Indonesia. Apart from the evidence that SH programs have contributed positively to the well being of the community, the study recommends the importance of stakeholdersinvolvement in the implementation of SH. However, to what extent that the stakeholders should involve in the SH, have not yet been followed up by further research. Similarly, the research by Hilman (2008) has introduced an approach to evaluate a location for housing with SH criteria. However, further research about how every stakeholder should contribute in the SH development in Indonesia has not yet been done.

One of the reasons which might affect to the limitation of the research in SH is because the 'housing backlog' condition in Indonesia, which brings the government focuses only on the 'economic aspect' of housing and not yet with the 'social' and 'environmental' factors. According to statistics of housing ownership in Indonesia, there is about 11,38 million of households who have not own houses yet in 2015. The government has been trying to overcome the condition by giving many policies, including subsidies through housing providers, i.e developer and bank institution. However, the ability of the supplier to provide are lesser than the demander. Housing *backlog,* the situation of this housing gap between supply and demand, is still considered as a serious problem. More than ninety percent of the backlog is coming from low-income families which have monthly income less than 7 million rupiah, and more than half of these families are non-bankable. Therefore, different approach should be done to overcome the problem. In addition to the earlier research by Larasati (2006) and Hilman (2008), a study on how stakeholder could be involved in the development decisions and policies should be done.

By using literature study on both empirical and theoretical analyses, combined with practical evidences, this paper attempts to reveal the importance of strategic collaboration of stakeholder in the implementation of SH development in Indonesia (van Leewen 2004; Kano, Furuta & Chao 2013, Manaf *et al.* 2016). While there is an evolutionary process on the discourse of stakeholder model of strategic collaboration, *Penta-helix model* is believed as an integrated approach to support the implementation of Sustainable Housing (Bjork 2015, Toncovic, Veckie & Veckie 2015).

**Sustainable Housing: Concept and Implementation**

Development can be defined as any transformation plan, policy and action to improve human well-being. Pieterse (2010) defines it as an intervention by organised parties in any societal problems which aims to achieve any improvement in livelihood or wellbeing. Housing is one of development sectors which any government should provide for their people. The inability of people to have a housing would affect to peoples' well being. They could not have a proper place to rest and stay, proper place to interact with others, as well as they would not have proper livelihood: to grow, to educate, to socialise.

The concept of sustainable housing is rather difficult to define as its lack of consensus over its definition. As Turcotte (2007) indicates, the disagreement exists on the which dimension of sustainable development should be prioritise in the housing development. While most of housing projects focused on the environmental and economic aspects of housing, the other considered the social factors cannot be omitted.

The concept of Sustainable Housing (SH) in this paper refers to a housing, which integrates the economic factors with social and environmental considerations. In this approach, a housing should not only economically affordable to people, but also socially accessible and environmentally acceptable. Turcotte (2007) refers SH to a Green Housing, however the term Green Housing is more on the environmental side than the comprehensive one. As a part of development programs, the term 'sustainable' accommodates a sustainable development approach which is firstly introduced in ' Our Common Future', a report of The World Commission on Environment and Development. The report, which is also known as the Brundtland report, refers ' Sustainable Development' as a development that

attempts to fulfill the need of the present generations without compromising the ability of future generations to meet their own needs'. In addition to that, Dreo (2006) and Swisher, Rezola & Sterns (2009) introduce three criteria which are required in any sustainable development project: environmentally sound, economically productive and socially just (*Cf.* WCED 1987, Turcotte 2007, Swisher, Rezola & Sterns 2009).

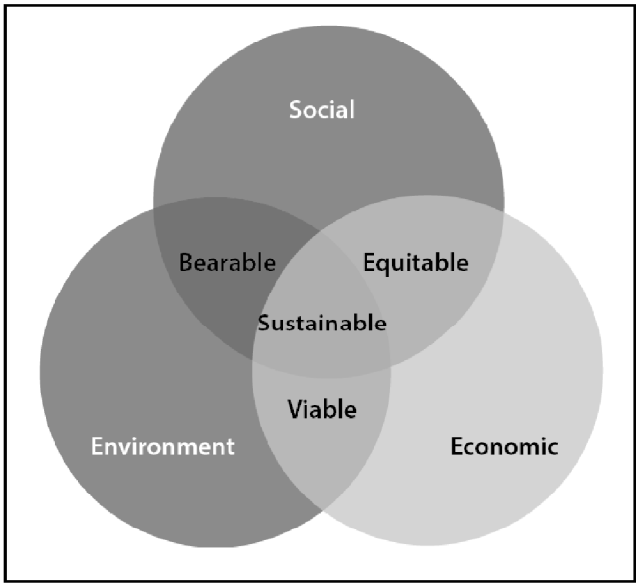


**Figure 1: The Triangle of Sustainable Development**

*Source:* Dreo (2006)

In housing development, sustainability factor considers that having a proper house should not only represent an affordable house in terms of price, but also to ensure that the house would also support the social activities. It supports the working activities, schooling activities, social and cultural activities as well as to ensure that the place is healthy for all the inhabitants. The research by Mulliner & Muliene (2011) and Ramsay (2012) suggest some criteria which should be fulfilled by a sustainable housing: affordable, accessible & adaptable, adequate & suitable, meets need of individual's well being/livability, and resource efficient. In their further research, they also incorporate the criteria with other social and environmental factors (Mulliner & Muliene 2015).

Pullen S. *et al.* (2010) added some other criteria, i.e. energy efficiency, construction materials, construction methods, affordability and some additional factors, including safety, quality of life, quality of place, and health. In the context of Indonesia, Bramantyo (2012) suggest to incorporate legal aspect of sustainable housing as it deals with the involvement both private and public institutions. The factor of law, regulation and governance are then playing a quite important role in the implementation.

Based on those studies, the SH criteria which should be incorporated in the housing development can be resumed as follows:

1. *Affordable*

   The housing should be acquired financially by any households, particularly for the lower income families. If the price is too high for some group of people, there should be available institution to support peoples' affordability.

2. *Accessible and Adaptable*

   The housing should be built in a location which the people could have easy access to work, education and social activities. It should also be supported by adequate support of public infrastructure,especially transportation facilities.

3. *Adequate & Suitable*

   The housing should able to accommodate the size of the family who will stay in the housing, and sufficient to accommodate them all.

4. *Meets the need of individual's wellbeing/Liveability*

   The housing is sufficient to fulfill the need of each family members.

5. *Resource Efficient*

   The housing should be supported by adequate energy and other resources for living.

6. *Construction Materials*

   The housing should be built by a good quality material which ensure that the building could long last for some expected generations to come.

7. *Construction Methods*

   The housing should be built by applying sustainable approach. Environmental factors are mostly considered in the construction process.

8. *Safety*

   The housing should be located in the safe area and supported by a safety system.

9. *Healthy*

   The housing should be physically, psychologically and environmentally healthy. It has a sufficient clear air, green area, playing ground for children, as well as environmentally friendly.

10. *Legal Compliance*

    The housing should comply with the rules and regulations, which govern the economic aspects, social aspects as well as environmental aspects of housing.

UN Habitat (2012) had also recommend to apply sustainable housing. The forum recommends that a sustainable housing should be designed, built and managed as a : 1) Healtly, durable, safe & secure; 2) Affordable for the whole spectrum of income levels; 3) Using ecological low-energy and affordable building materials and technology; 4) Resilient to sustain potential natural disasters and climatic impacts; 5) connected to decent, safe and affordable energy, water, sanitation and recycling facilities; 6) using energy and water most efficiently and equipped with certain on-site renewable energy generation and water recycling capabilities; 7) Not polluting the environment and protected from external pollution; 8) suitably located in terms of jobs, shops, healthand child-care, education and other services; 9) properly integrated into, and enhancing, the social, cultural and economic fabric of the local neighbourhood and the wider urban areas; and 10) properly run and maintained, timely renovated and retrofitted.

The documentation by the Asian Coalition for Housing Rights (2011) shown that sustainable housing is applicable to people in the lower-income groups. By using the case of *Koh Mook* Community in Thailand, sustainable housing can be implemented in the land secure area by involving all related parties in the realization. Similarly, the case in *Ale Yaw Ward* of *Hlaing Tar Yar* Township in Yangon City of Myanmar, shown that the sustainable housing could also be built in an unsecured land which is pressured by development and land speculation. Both cases examined that sustainable housing concept successfully lifted up the well-being of the people, although they live in the condition which are not favorable to their circumstances. However, both cases shown that collaboration between all related stakeholders are required to implement the approach.

**Problem of Sustainable Housing in Indonesia**

While the government of Indonesia had given the guidance that sustainable factors should be implemented in housing development in Indonesia, less research has been done in the approach. Lase (1996) and Prajitno (1997) were among the earlier researchers who did the study on sustainable housing in Indonesia. While Lase underscore some important environmental factors, which should be considered in the housing, Prajitno emphasized various aspects, i.e. finance, legal as well as ecological factors in housing development, and how multi-sectors should be accommodated by housing policy maker and developer. However, further research has not yet been done as the country has been struggling with the *housing backlog* problem: the number of housing demand by the households are very much higher than the housing supply which could be provided by the government as well as the developers. (*Cf.* Lase 1996, Prajitno 1997).

As It could be seen in the table 1 above that, until 2015, there was about 11.38 million households in Indonesia who do not own houses, or live with other families or relatives, including renting houses. Among those 11.38 million, 93 percent of them are low-income families with an income of maximum 7 million rupiah per month (approx 500 USD) and about 60 percent of them are working in informal sectors with an income of maximum 4 million rupiah per month (approx. 300 USD). The problem of a *housing backlog* tends to influence the decision of the government to focus more on the affordability aspect of housing rather than considering the comprehensive factors, including social and environmental factors. Therefore, it seems that the sustainable housing was not really be a focus on the housing development. The government of Indonesia through the Ministry of General Affairs and Community Housing has been allocated its budget more than 10 trillion rupiah to solve the problem, by subsidise the financial intermediaries, which could provide mortgage

**Table 1**
**The Distribution of Housing backlog in Indonesia in 2015**

| *Desil of the HH* | *Income per month (Million Rp)* | *Spending/ month (Rp juta)* | *Saving Ability (%)* | *Housing Investment Ability (Million Rp)* | *Number of Backlog (Unit)* | *Banking Segmentation* |
|---|---|---|---|---|---|---|
| Desil 1 | 1.2 | 1.2 | 0% | 0.2 | 6,83 million | Informal Sectors 60% |
| Desil 2 | 1.8 | 1.4 | 21% | 0.5 | | |
| Desil 3 | 2.1 | 1.6 | 24% | 0.6 | | |
| Desil 4 | 2.6 | 1.8 | 30% | 1.0 | | |
| Desil 5 | 3.1 | 2.1 | 34% | 1.2 | 3,76 million | Formal Sectors 33% |
| Desil 6 | 3.6 | 2.3 | 34% | 1.5 | | |
| Desil 7 | 4.2 | 2.7 | 36% | 1.8 | | |
| Desil 8 | 5.2 | 3.2 | 39% | 2.4 | | |
| Desil 9 | 7.0 | 4.3 | 39% | 3.2 | 0,80 million | Commercial 7% |
| Desil10 | 13.9 | 8.2 | 41% | 6.6 | | |
| Average | 4.5 | 2.9 | 30% | 1.9 | Total = 11,38 million | |

*Source:* BTN (2016)

to the people, including subsidise the interest which charged by the bank in the mortgage. However, the current progress in housing sector shows that the government support could only support ten percent of the housing development of the total of *housing backlog*, while at the same time, another ninety percent is characterized as non bankable and work in the informal sectors (Manaf 2013, BTN 2016). Similarly, the data from the government of Indonesia has also shown that only 398,981 houses could be built during 2011-2014 while the targeted plan of housing development in Indonesia from 2011-2014 was about 1,350,000 houses (Ministry of General Affairs and People Housing, 2015). In addition to that, the 11,38 million of *housing backlog* in the earlier Table 1 was the condition in 2015. The data is lower than the *housing backlog* in 2010 with about 13,6 million. In fact, it is an improvement. However, if it is compared with the changes in the household numbers between 2010 and 2015, the decreased number of housing backlog seems not solving the housing problem yet. Between 2010 to 2015, the number of families in Indonesia has increased from 61,6 million to 65,5 million families. It means that although the housing backlog has decreased about 2,22 million, however the number of families was also increased by 3,9 million, in contrary (BTN 2016).

Furthermore, there is also a phenomenon of an empty house as it is shown in the above Figure 2. It means that some people who were given a subsidized housing by the government, which is mostly low-income people, did not occupy in the houses that they had. Accessibility to the workplace, to school, as well to other public services, are some of the reasons why they did not use the housing as it was supposed to do. The phenomenon has been analysed by Antariksa since 1985 (*Cf.* Antariksa 1985).

## Stakeholder Collaboration for Sustainable Housing in Indonesia

The earlier section has given a general analysis that the problem of housing in Indonesia can be classified into two main issues: the housing backlog and the sustainable criteria of housing, which has also an indirect impact to the housing backlog. As the housing problem has been given a serious attention to the government, there is an urgent call to solve the housing problem in Indonesia. If the government would only rely to the role of government

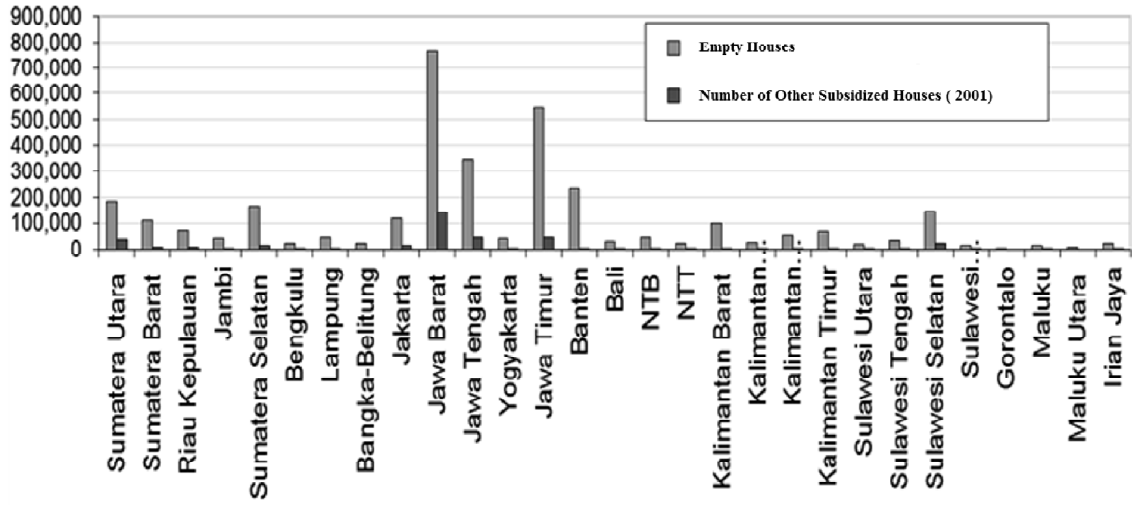


**Figure 2: Number of Empty Houses in Indonesia (2001)**

*Source:* BTN (2016)

and private institution (business) to provide housing for the people, in particular for the low-income families, the result would not as positive as it would expect. According to the Ministry of General Affairs and Public Housing, the capacity of the collaborative actions by the government and private sectors, including housing developer and banking institution, to build housing for the people are only 250 to 400 thousand per year. Considering the housing backlog data in 2015, it requires about 28 years to solve the problem of housing, assuming that the number of households is not changed, which is impossible. An alternative approach or different policy should be introduced.

The government as the policy maker should consider an approach, which is beyond the role of private institution (housing developer and banking institution) and the government itself. In this context, an analysis all related stakeholder is needed. While private institution and government were the two main stakeholders as the provider of housing and the community itself as the receiver or demander of the housing, a participation from other stakeholders are needed, as it was also suggested by previous research by Larasati (2006) and Hilman (2008). Larasati examine various cases of sustainable housing development which had been implemented in Indonesia: 1) *Kampung Improvement* Program (KIP) which was supported by the World Bank since 1970, 2) *Eco-House* program, initiated by Surabaya Institute of Technology in 1996, coordinated with the Ministry of Public Affairs and Infrastructure Development Institute (IFI) Japan, 3) *Eco-House* by the Center for Environmental Research of East Java in 1990, supported by the World Wildlife Fund, and 4) *Kampung Banjarsari* Program in Jakarta, in 1970, initiated by a Women Farmers Group in Jakarta, and supported by UNESCO in 1996. The study concluded that the sustainability is important to be implemented in the housing development, and collaboration among the stakeholder is important to consider. Similarly, the study by Hilman (2008) also concluded that stakeholder should be included in the sustainable housing development.

The importance of stakeholders collaboration for sustainable housing has also been emphasized by Brinkerhoff (2002), van Leewen (2004), Clark & Fuller (2010), as well as Manaf (2011, 2013). Nevertheless, Timmer & Kate (2006) stated that strategic collaboration among stakeholders is the key factor for the successful implementation of sustainable housing.

## Pentahelix Model for Sustainable Housing in Indonesia

Stakeholder's collaboration is considered to be important in the implementation of sustainable housing development. However, less study has been done in this

issue, particularly in the sustainable housing in Indonesia. Thus, a critical question would follow up in terms of which stakeholders should be included in the collaboration, and in what term and condition the collaboration should be made. These questions would bring to the analysis of stakeholder model for sustainable housing (*Cf*. Brugha & Varvazovsky 2000, Sule & Saefullah 2009)

Previous researches have shown that there were four model of stakeholder which have been implemented in terms of stakeholder collaboration: 1) *dual-helix or government-business dyad*, a stakeholder's model of collaboration between government and business/private organization, 2) *triple-helix*, a stakeholder's model of collaboration between government, business/private & academician, 3) *quad-helix*, a stakeholder's model of collaboration between government, business/private institution, academician & community, and 4) *penta-helix,* a stakeholder's model of collaboration between government, business/private institution, academician, community and non-government organization (NGO) or mass media (Tonkovic, Vecky & Vecky, 2015).

By using three cases in Colorado, Van Leewen (2004) shown that *dual-helix* stakeholder model between government (G) and business (B)/private sectors (developer and finance institution) have been effectively supported in the implementation of sustainable housing for the street people, those who have no houses, and mental illness group of people. For the Indonesia context, an earlier study by Prajitno (1997) concluded that finance, legal and ecological aspects of housing should be incorporated in the sustainable housing, particularly in the rural area of Indonesia. Ajayi (2012) has also found a similar result for *dual-helix* collaboration in sustainable housing. However, the study of Ajayi examined the collaboration between Community (C) and Government (G) in sustainable housing could also be implemented, particularly in the case of public housing. Similarly, the research by Battams & Baum (2010) did study of *dual-helix* type of stakeholder's model in sustainable housing for lower income families. Furthermore, Manaf (2013) did a study, which examine the *triple-helix* model of collaboration for sustainable housing in Indonesia. His research evaluated the collaboration between the government (G), Business (B) and Community (C) in a small village of Kutoharjo in Kendal district of Central Java. This research reveals that community could also contribute to the implementation of sustainable housing. For instance, by giving some inputs to the government in which factors the government and the private sectors need to consider between economic, social and ecological factors. The Asian Coalition for Housing Rights (2011) empirically has shown the successful collaboration of *quad-helix* for Sustainable Housing in Fiji, Thailand and Myanmar. The stakeholder's collaboration between the government (G), community (C), non-government organization (NGO) and academician (A) in those cases have successfully supported the implementation of sustainable housing. In the context of Indonesia, Manaf (2011) has also found that the *quadrupe-helix* collaboration among stakeholders in sustainable housing, does not always found a significant result. By using a case of low-income communities in Semarang city, Central Java, the study analyzed the sustainable housing projects from two groups of income communities both from formal and informal sectors. The study concluded that the collaboration between the government (G), Private Sectors (B), Community (C), and NGO in the informal sectors of the low-income communities are less successful in comparison with the low-income communities from the formal sectors. However, the study also evaluated that the government roles in both groups are the success-factor in the implementation.

Those earlier researches clearly underscored that a stakeholder's collaboration in the implementation of sustainable housing is important and could be a strategic approach to sustainable housing. The earlier researches have also brought a conclusion that, there are five stakeholders could be involved in the collaboration: government (G); business or private sectors, including developer and banking institution (B); academician (A); community (C); and non-government organization (N). Thus, according to Tonkovic, Vecky & Vecky (2015), this collaboration categorized as *penta-helix* model of Stakeholder's collaboration.

A successful penta-helix collaboration has been reported by the Asian Coalition for Housing Rights (2011) with the case in Fiji Islands, Thailand and Myanmar. The

following figure 3 depicts of how penta-helix model for sustainable housing, especially for low-income communities.

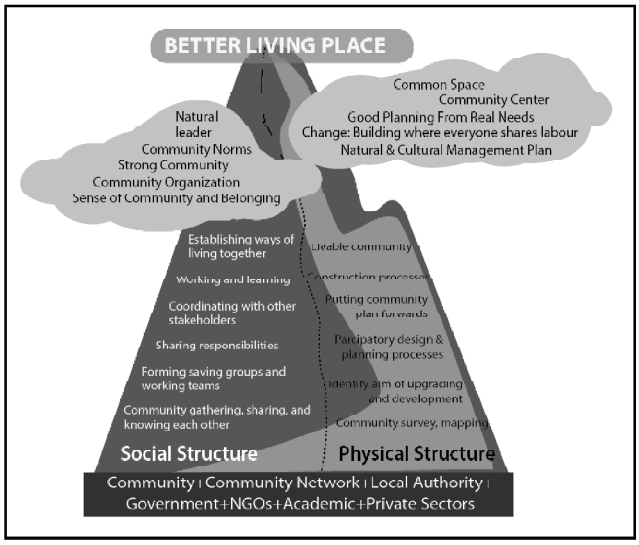


**Figure 3: Strategic Collaboration in Sustainable Housing between Government, Private Sectors, Academician, Community, and NGOs**

*Source:* ACHR (2011)

Special emphasizes is given to the role of academician (A) and non-government organization (N), while many research clearly underscored the contribution of government, business and community. Academician could contribute the collaboration by providing various comparisons of best practices from research's point of view of how sustainable housing could be implemented in a particular context. Similarly to the role of non-government organization in the stakeholder's collaboration for sustainable housing in Indonesia. Midgley et al. (1986) and Tomponu (2011) support the importance to accommodate non-government organization (N) in the stakeholder's collaboration for sustainable housing. According to him, NGO could provide a housing rights to the government as well as involve in the planning and implementation of sustainable housing.

Although, the *penta-helix* model of collaboration is important, however, there is no research has been done in this specific approach in Indonesia. Earlier researches of sustainable housing in Indonesia had only evaluated in the *dual-helix, triple-helix* and *quad-helix* of collaboration, but not yet the *penta-helix*, particularly in the incorporation of non-government organization. Although earlier researches have been done in Sustainable Housing in Indonesia, however, none of the researches emphasized the strategic collaboration between stakeholders by using penta-helix approach. (*Cf.* Lase 1996, Prajitno 1997, Larasati 2006, Hilman 2008, Manaf 2011 2013).

Further research in the *penta-helix*-model of stakeholder's collaboration in sustainable housing, need to be done to examine its importance as well as to evaluate the role of stakeholders in solving the problem of sustainable housing in Indonesia. As suggested by Kanno, Furuta & Chou (2013) the research might starts with the assessment of perception gaps between stakeholders to elaborate each of stakeholder's interest, and identify various factors, which could be accommodated to support the collaboration. Furthermore, a comprehensive approach of combination between qualitative and quantitative research methods is also important to apply. While Creswell (2013) suggest a qualitative approach, Kanno, Furuta & Chou (2013) emphasizes a quantitative approach, particularly with the identification of perception's gap among the stakeholders. The mix-methods approach would also answer the challenge by Muscat, Blackman & Muscat (2012).

As shown in the figure 4, the authors would suggest the following figure 4 as a proposed analytical model for the research, which then requires to further examination with both quantitative and qualitative studies.

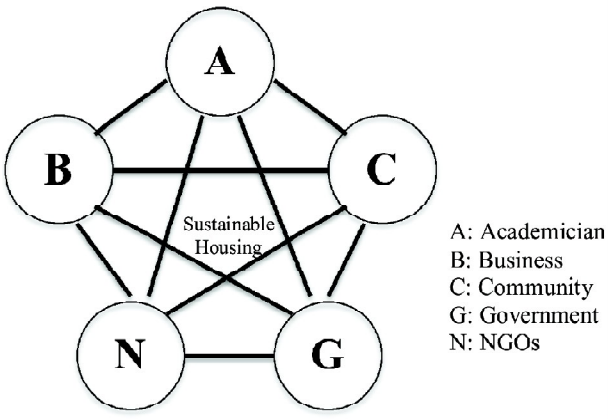


**Figure 4: A proposed analytical model for penta-helix stakeholder's collaboration for Sustainable Housing**

## CONCLUSION

Sustainable Housing has an important roles in the achievement of well-being of the people. It contributes to the health and well-being of the society (Illesanmi & Ogunshakin 2008, Prochorskaite & Maliene 2013). It provides people with not only a secured shelter to live, but also its accessibility to social life and safe environment. It would not only fulfill a recent generations happiness, but also for the future generations. However, there are various challenges in the implementation of Sustainable Housing (Li & Zhao, 2011). One of the challenges is to implement the approach for low-income communities which economic factor is predominantly considered to prioritize than social and environmental ones. This has been evaluated in the context of Indonesia. However, many researches shown that prioritizing economic factor than other sustainability factors does not guarantee that the housing problem for low-income families will be solved. Therefore, a different approach should be applied to overcome the sustainable housing problem. Stakeholders analysis is necessary to identify this such a problem and proposing a *Penta-helix* stakeholder's model of collaboration would be an alternative approach to solve sustainable housing in Indonesia.

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