



Layout Tambaklorok Fisherman Village of Low-Income Housing: A Case Study of the Central Java, Indonesia

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Puddles are a common sight in the coastal fisherman villages located near the Java Sea. . One of these villages is Tambaklorok located in Semarang, Central Java. The village is in a slum area and is mostly populated by underprivileged people in Semarang with low quality of housing conditions. This paper identifies how the people of these fishing villages build their house on a low income. The research used a qualitative approach to gain an in-depth discussion regarding the housing structure. The research relied on a series of interviews and field observations. It was determined that interviews could give a deeper insight into the housing structure. For this reason, interviewees were carefully chosen from the Tambaklorok population. The 11 heads of family that were involved in the interview process, were categorized as poor families with poor housing conditions. The house foundations, material of roof, walls, floors, and latrines were all included in the analysis. The result shows that the average size of the house is 30 m², using conventional stone foundation, asbestos roof, unrefined bricks wall and contained bare earthen floors which were sometimes inundated by tidal floods. In addition, it was found that room height was 2.5 m and there was no toilet in the house. Most of families were using landfill or sand sacks to elevate the housing floor and used stilts structure. To overcome these matters, the government provided the public toilet and bath upgraded the infrastructure of the shipyard and road in order to bring up the better economic development wealth for the Tambaklorok fisherman village.

Key words: *housing, structure, poor, fisherman, village, government, role.*

Introduction

Accessibility to housing is an issue for the population that needs to be constantly evaluated. As the population grows, the need for housing supply will always occur in urban or rural area. Throughout the world, it has been reported that a billion new houses will be needed by 2025 in order to accommodate new urban dwellers. It is also estimated that the meager resources of 330 million people are likely to be stretched and strained by their housing needs, accompanied by intense emotional distress (UN Habitat, 2015).

Housing for the poor is perceived in a different way than ordinary people. The essential factor in choosing a housing location is based on to their workplace. Quality and ownership status of the house is the next and sometimes even the last consideration (Panudju, 1999). For this reason, poor people tend to live with a lack of housing quality and environmental conditions. Lack of adequate housing or housing which is of poor quality will inevitably negatively impact the extent of social and economic development in a particular communities a (Social Work Policy Institute, 2006).

This vulnerable group also has minimal access to social services. Without housing which is of sufficient quality, there is an ever-increasing probability of rendering vast segments of disadvantaged population groups completely powerless and incapable of participating in decision making (Manomano & Tanga, 2018). In an urban Indonesian context, Fishermen are categorized as poor because their income is below the minimum urban poverty standard. The conventional perception, especially for the small-scale fisheries in less-developed countries, is that fisheries and rural poverty are closely related due to the open access nature of the resources. This creates limited access to land and/or other resources (Béné et al, 2003a). These factors can be categorized into two main contributions: direct (financial) and indirect (technical) restrictions (Béné et al, 2003b).

The direct restriction results from the various legal legitimated fees and illegal taxes that are imposed for the access to the water-bodies. Direct, or technical issues are related to the restriction of access to certain fishing grounds. According to the Statistic Bureau of Indonesia (BPS) in 2008, the number of poor citizens in Indonesia reached 34.96 million and 63.47 % of the was living in rural and coastal area. The fisherman village is part of the urban village is still classified as a slum area. People in this area have traditional livelihoods, and minimum educational background. This social condition often causes the fishing families to face some difficulties in acquiring decent housing. The low-income and/or ethnic minority communities are already burdened with increase rates of diseases, limited access to health care, and other

health disparities. They are also the population living with the worst building environment condition (Hood, 2005; Zahari & Dhayaalan 2016). In other studies, on the health of fishing communities, it was found that fisherman in Chioggia, Italy had continuous and prolonged work where they were exposed to work accidents, noise-induced hearing loss, solar keratosis, cataracts, obstructive bronchitis, rhino-sinusitis, otitis media with tympanic perforation and ECG alterations. These conditions occurred in addition to the stress and risk associated with deep-sea fishing (Casson, 1998).

Housing is also affecting poverty in Indonesia. One criterion to assess poverty is the housing condition. Non-food commodities which have a significant role on poverty standards in Indonesian urban and rural areas include housing, gasoline, electricity, education and bathing tools (BPS, 2018). Indonesian people are categorized as poor according to their housing conditions. This includes the lack of home ownership, floor area less than 8m², 50 percent of the house floor is bare soil, the wall structure is made from bamboo or bad quality of wood and the electricity is 450 watts (BPS, 2018). The Multidimensional Poverty Index (MPI) defines a person as being in poverty by if they have no access for clean water or have to walk for 30 minutes to get the clean water, the floor of the house is covered by mud or cow dung, the cooking fuel is by the use of firewood, saw dust or paddy husk, and the assets of the household does not own at least two of: television, radio, telephone, bicycle or motorcycle or tractor (Alkire and Santos, 2010).

For the purpose of this study, research has been focused on a fishing village located near the Java Sea known as Tambaklorok Village in Semarang, Central Java. This village is in a slum area and consist mostly of the poor people in Semarang with low quality of housing condition. Previous government projects in this area focused mostly on road infrastructure projects aimed to overcome the inundation of tidal flood to minimize the image of a slum area. This resulted in the elevation of the road which is always higher than the housing floor.

Preliminary studies in Tambaklorok show that the cause of poverty in this area is predominantly structural. This is due to limited access to financial capital, natural phenomena caused by tidal flooding, and the culture related to financial management (Natalia & Alie, 2014; Mussadun & Nurpratiwi, 2016; Zainol,et.al 2018). Other studies related to the fisherman village focus on analyzing the effect of gentrification and spatial studies on coastal settlements (Thompson, Johnson, & Hanes, 2016; Marpaung & Silaban, 2018). This paper aims to identify how people affected by poverty in fishing villages build their houses on a low income and analyse the role of the government in overcoming housing issues in the fishing village of Tambaklorok.

Methods

This research utilized a qualitative approach to gain an in-depth discussion on the housing structure. Data collection relied on a series of interviews and field observations. As the interview could give a deeper insight into the housing structure, interviewees were carefully chosen from inhabitants Tambaklorok. We interviewed 11 heads of family and assessed their houses. The interviewees were categorized as poor families with poor housing conditions. For the purpose of this article, this paper only discusses 5 of these houses. These houses were represented in this research as they exemplify the poorest housing conditions. The list of the 11 families was obtained from the Chief of the Tambaklorok community where he shortlisted the poorest families. The Chief was elected based on the consensus of the community and has been living in the neighborhood for over 30 years.

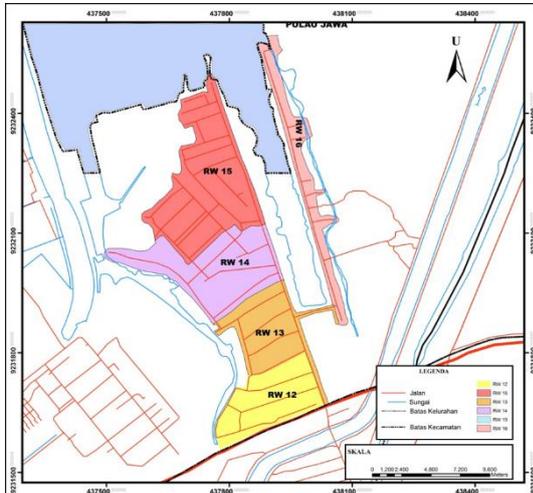
The research relied on primary data collection through an in-depth interview with the community Chief, observation. Secondary data was collected from the families in the Tambaklorok Village. Permission for this research and the collection of data was obtained from an official of Tambaklorok Village.

The research focused on mapping the physical aspects of the houses. There are four aspects of the housing structure to be investigated in this research. This includes the wall, roof, floor and latrine. The data collection phase was used to draw the house floor plan, side and front view and observation picture. From this data, the characteristics of the fisherman village houses can be drawn, and further recommendations can be specified.

Houses of Fisherman Village

Tambaklorok village is located on the coast side of the Java Sea (Fig.1). The Residents in the fisherman village are not all dependent on fishing activities. Other forms of employment but include inter-island transportation, intermediary retail traders related to the fish caught by the fishermen, and other businesses related to the sea and coast. Housing in Tambaklorok faces the threat of sinking because the land in the area subsides 5-10 cm per year. These conditions render the fishermen unable to upgrade their house when tidal flooding is reaching their living room. Several efforts were carried out by the community to improve their living condition in such a degraded environment. The villagers of Tambaklorok tend to stay in the area and attempt to deal with the situation themselves. It is understood that in order to obtain a proper environmental condition and have a better home, they must pay a high price. Therefore, they must choose between maintaining the quality of life they experience now or have a home in the village (Indrianingrum, 2017).

Fig. 1. Map of Tambaklorok Village
(Development Planning Agency at Sub-National Level of Semarang City, 2011)



The first house (Fig.2) is located adjacent to the sea border, separated from the other housing group. The house is 42 m² with low quality of wood for walls, a scrap metal roof, and bare soil floor and without building foundation. According to the interview, the house is subject to flooding almost daily due to the tides. This is especially prevalent at night. The homeowner cannot afford to make structural repair. He can only attempt to stabilize the house in order to make it a better place to sleep. The house only consists of a functional room, storage room alike, kitchen and non-standardized toilet. The functional room is utilized for sleeping, eating, living room, family room. The toilet was built on the water pond with some bamboo to step on and is unhygienic.

Fig. 2. House A



House B (Fig.3) is also located in this housing group. The house area is approximately 73 m² with a tiled roof, damaged brick walls, conventional stone foundations and bare soil floor. The house is divided into terrace, living room, two bed rooms, kitchen and bath room with no toilet. For room partitioning, the owner uses plywood and curtain for separating the rooms. The seepage of tidal floods occurs at the back part of the house. The observation showed that the house was structurally damaged, in particular, the roof and walls. Even though the house area is larger than the other house, but half of the house is damaged. The room height is a low (2.5 m) with limited air flow and hot conditions in the afternoon because there is no ceiling.

Fig. 3. House B



House C (Fig.4) is also located in the housing group. The house is only 20 m² with an asbestos roof, unrefined brick walls, conventional stone foundation, and bare soil floor. The house has no specific partition wall as the 20 meter square of the house is multi-functional. The owner uses the front part for cooking and sleeping, the back part for doing the laundry. The house does not have a rear wall because its structure is attached to a house behind. There is no bathroom, only a water tap in front of the house to collect water for household purposes. The owner uses a public latrine for sanitation activities. The room height is also a low (2.5 m) and contains no ceiling, resulting in high indoor temperatures at noon.

Fig. 4. House C



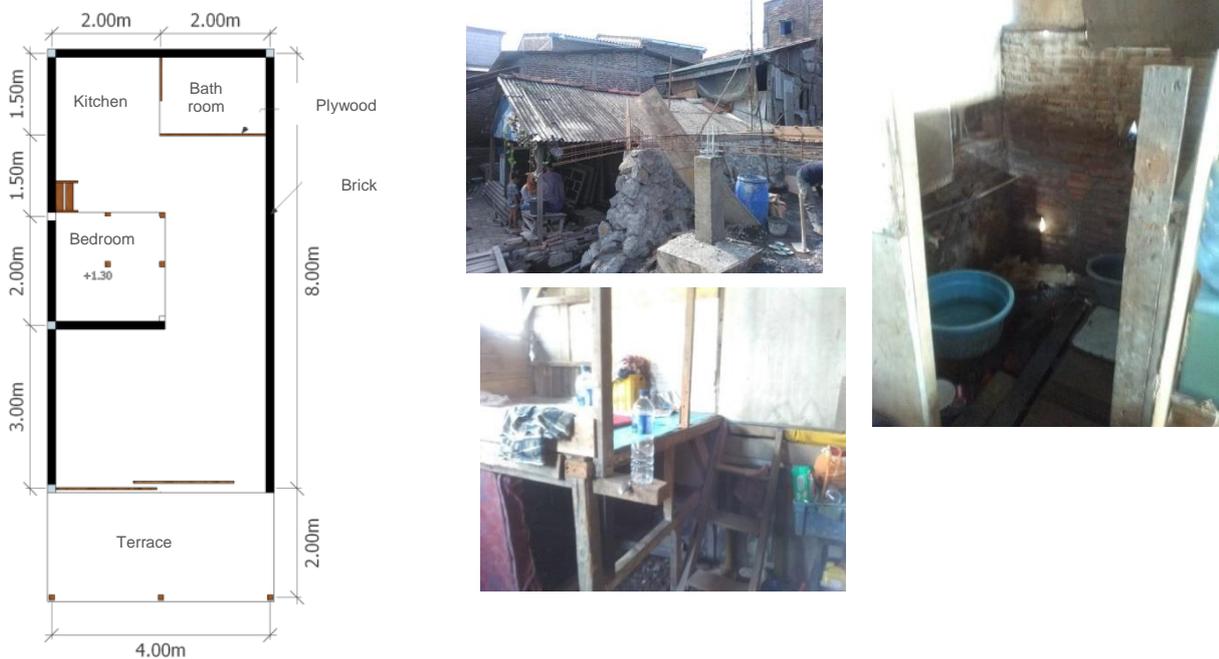
House D (Fig.5) is in the same housing group as A-C. The house is 15m² with an asbestos roof, andplywood walls and flooring. The house is set upon a stilt structure, the house is elevating it 50 cm from the ground. This structure is beneficial because it can make the house dry from tidal floods or seepage. The main material is bamboo because bamboo is more resistant in water. The interviewee said that this house was built usinggovernment financial support. Even though the house is small in scale, the room separation is clear. There are rooms for sleeping, cooking and also for bathing but no toilet. The owner uses public latrine. The house has opening at the roof to allow sunlight entering the house and the roof height is enough for airflow.

House E (Fig.6) has 32 m² area with an asbestos roof, unrefined brick walls, and plywood and bare soil for flooring. Tidal floods and seepage enter the house daily. The owner elevates the sleeping area using bamboo to avoid water and humidity from the floods. There is no specific room partition inside the house, but according to the activity there are functional room for family activities, sleeping area (elevated), cooking area and bathroom (no toilet). The owner uses wood structure for roofing but upon inspection, appears quite old and possibly rotten.

Fig. 5. House D



Fig. 6. House E



Housing Materials and Living Culture

The description above (House A - E) are for five (5) of eleven (11) houses that were observed in the fisherman village of Tambaklorok. The rest of the houses (house F – K) are described in the Table 1. All of the houses observed were built by the owners or were inherited.

If we consider the previous description, it becomes clear that most of the people in the village live in an area less than 50 m². Based on the classification of the Indonesian Statistic Bureau, one of the criteria of poor household is living in the house with total floor area less than 8 m² (BPS, 2018). Even if the floor area is bigger than the poverty standard, it does not mean that the family is not poor. They live in an inadequate housing and endure poor environmental condition (tidal flood, trash and land subsidence). A house that is less than 50 m² house is inadequate for more than 5 family members. Due to this limited space, houses in the village tend to have a functional room as the place for many household activities. At least each house has one functional room for family room, dining, stacking the laundry, placing the vehicle (motorcycle and bike) and even for sleeping space. The space which is separated is the bathroom and kitchen. It appears that the homeowner seeks comfort in the functional space because the kitchen and bathroom are likely to be dirty and wet. The houses also use curtains and plywood as room divider. This material is cheaper and easily installed.

Table 1: Housing structure details of House A - K

Structure	Area (m ²)	Roof	Floor	Wall	Room Divider	Functional room	Bathroom	Toilet	Foundation
A	42	Metal	Soil	Plywood	No	Yes	Yes	No	Stone
B	73	Clay Tile	Soil	Brick	Plywood, Curtain	Yes	Yes	No	Stone
C	20	Asbestos	Soil	Brick	No	Yes	No	No	Stone
D	15	Asbestos	Plywood, bamboo	Plywood, metal	Plywood	Yes	Yes	No	Bamboo
E	32	Asbestos	Soil	Brick	Plywood	Yes	Yes	No	Stone
F	18	Clay Tile	Ceramic	Brick, plywood	Plywood, curtain	Yes	Yes	No	Stone
G	22.7	Asbestos	Soil	Bamboo, brick	No	Yes	Yes	No	Stone
H	30	Metal, asbestos	Soil	Plywood	Curtain	Yes	Yes	No	Stone
I	45	Asbestos	Soil	Brick	Curtain	Yes	Yes	No	Stone
J	26	Clay Tile	Cement	Brick	Brick	Yes	Yes	No	Stone
K	45	Asbestos	Soil	Brick	Plywood	Yes	Yes	No	Stone

Asbestos is the leading choice for the roof as it is cheaper and long lasting. In Indonesia, regulation has not prohibited the use of asbestos as a roof material due to nor stops its manufacture despite the health risks of asbestos being very clear. The report from Welfare Statistics of Indonesia (BPS, 2018) mentioned that 9.08% of Indonesian households are asbestos user. It means that over 24 million households are exposed to asbestos related health

issues. The results of the removal of dried roof cement can generate the release of asbestos fibers, causing an inhalation hazard for workers (Oberta, Poye, & Compton, 2018). The toxicity of asbestos makes many countries prohibit the use of this material.

Some of those houses are still using clay rooves rather than asbestos. Even though these two materials generate the same indoor temperature (Sukanto, Budiana, & Putra, 2016), a clay roof is better for respiratory health. Most interviewees indicated that they will change the clay roof with asbestos when their roof is renovation. The reason is asbestos require less material (wood) for roof structure and is faster to install, therefore minimize working cost. The economic reason behind selecting housing materials is stronger than health reason (Zayapragassarazan, 2017).

The wall structure is unrefined brick which is in poor condition. The floor is bare soil and sometimes covered by thin mat for sleeping and sitting purposes. For parts not meant for sitting purpose, they leave it uncovered. There is no specific furniture in the houses aside from a few chairs, a table, and a wooden bed. Other household activities are carried out on the floor. The material of the wall and floor makes the house very humid and unhealthy. Tidal flood also seeps easily into the house. When the flood or seepage comes into the house, all the belongings are placed in a higher place such as the table or bed.

The culture in the fisherman village is closely connected to water. Land subsidence in the area makes the living quite specific and unique. The land drops 5-10 centimeters per year and the ground level goes below sea level. Tidal floods and seepage cannot be eradicated. The residents use a landfill system to elevate the housing floor in order to eliminate seepage. They elevate usually one meter from previous ground level and are required to purchase soil to pile up the floor. Purchasing soil for landfill requires a significant amount of money. Sometimes home owners will be in debt to renovate the house. This kind of method is practiced by most of the inhabitants in the village. Within 5 years they will spend money again for raising the floor as floods and seepage reach the house.

Construction method implemented by House D should be considered in regard to any further renovations. House D uses bamboo stilts to elevate the house and has been built by government financial aid. Although this method seems to be ideal for the inundated environment, the community has been widely uninterested. Adaptation of dwelling culture for stilt houses has not been performed in the area, although this method has been performed in riverside settlements in Banjarmasin, Kalimantan (Goenmiandari, Silas, & Supriharjo, 2010). The people in the fisherman village of Tambaklorok still show a land-oriented living culture even though their environment is inundated every day. The same geographical condition is also present in Bangrakon, Thailand. People in the area use high stilts in the construction of their houses to avoid flooding during wet season (Pittungnapoo, 2012; Zeyn, 2018).



The main problem for these wet areas is the toilet. High level of ground water makes it impossible to build a conventional septic tank. Less than 90% of the people in Tambaklorok do not have toilet facility. They have access to public water services have to use public toilets built by the community or the government. For houses which are adjacent to the water pond or seafront, they build the 'toilet' on the water using bamboo stilts (house A Fig.2). Toilets becomes a critical sanitary issue in the area due to the ground water level.

Government Role in Improving Quality of Life

The housing condition in the village demonstrates the level of economic poverty that people are experiencing. The position of the village in the coastal area of Java Sea has potentials that should be developed to improve the villagers' quality of life. The government of Indonesia and local government of Semarang Municipality have a number of strategic development plans for Tambaklorok. The biggest development in the master plan is the Marine Tourism Kampung. This project has been is said to be the ultimate tourism project for Semarang (Sunarti, 2018; Zhang, 2018). The master plan includes some physical development plans such as infrastructure (road and drainage), shipyard and tourism facilities (Fig.7). These developments are progressing vigorously as a strategic effort from the government to improve the economy of Tambaklorok. The construction process started in 2015 with the construction of the shipyard to enable the fisherman to dock their boats at the canal next to the housing area. The ongoing project is the expansion of the road from 5 meters to 20 meters and also creating a green open space. This project also aims to relocate the existing community facilities such as public markets, fish auction center, and other facilities to make way for land acquisition for the road development project.

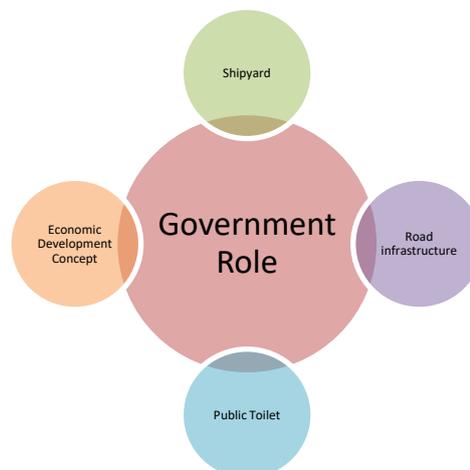
In addition to the marine tourism plan, programs programs were developed in Tambaklorok to increase the quality of the built environment. Since 2015, the government has been working to minimize the slum image by implementing a number of infrastructure developments (see Table 2). The land subsidence made the development less sustainable.

Table 2: Government Programs in Tambaklorok (Sunarti et al., 2018)

No	Aspect	Program	Year	Project details
1	Housing	RTLH	2015-2016	Uninhabitable houses
2	Road	PLPBK	2015-2017	Main village roads and kampong road
3	Drainage	PLPBK	2015-2017	Widening and repairing drainage construction
4	Public toilets	PLPBK	2014-2015	Build public toilets in strategic community spots (RW 14 and RW 15)

Another initiative from the local government that is separate from the master plan is the building of public toilets. As has been stated above, most of the Tambaklorok families do not have a toilet at home due to the physical limitation of the soil (seepage of tidal flood). With this limitation, the people are unable to build conventional septic tank systems, and to build non-conventional system will require more money. The government has built public toilets in the Tambaklorok Village. People who want to use it must pay for the service. The money collected will be used for the maintenance of the facility such as sanitation, water supply, and payment for the person who is in charge of the facility. Despite these efforts, the environmental conditions of the village are still in the slum category because the developing the housing condition is not feasible and the infrastructure is not adequate.

Fig. 7. Government Role improving the Tambaklorok Village Facilities



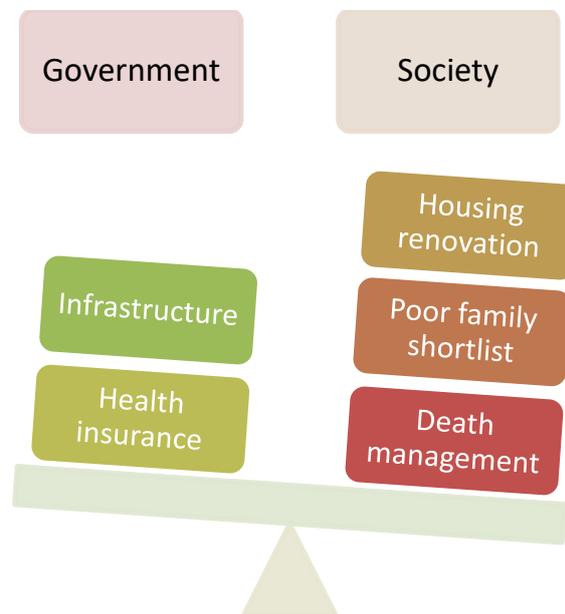


The master plan for the Coastal Village mainly focuses on physical development, rather than on social and economic development of the region. The expectation is that economic and social development will be an outcome of the physical development. With the promotion of the Coastal Village as a tourism project, it is expected that tourists will buy the fish, fish products and visit culinary and tourism spots. There are some emerging economic development programs conducted by NGOs and universities to empower the community especially the woman. Some of the economic programs are conducted by a university by making Tambaklorok a sustainable village, such as production of hygienic shrimp paste, salted egg, duck and quail farming (UNNES, 2011).

The Government not only plays the role as an enabler of the development, but also as the provider. The government provides health facilities through health insurance. Most of the residents are members of the social health insurance. This scheme provides complimentary access to government health facilities. and assists many residents that suffer from chronic diseases. The role of the government is limited regarding enabling and empowering a community to build a more established society based on its local capital. The Tambaklorok community is categorized as *gemeinschaft* which indicates a strong social and family relationship due to its specific livelihood (Dimitra & Yuliastuti, 2012).

Fig. 8 shows that community's role is more apparent than the government role. The role of the community is to include managing housing renovation, handling funeral arrangements and short-listing poor family. As mentioned previously, the cost for most housing renovations is placed on the homeowner and only few houses renovated by NGOs and the government. A similar case was observed in Ghana, where the small-scale artisanal marine fishing communities are generally characterized by low levels of production and incomes. Poor living conditions and chronic debt require support services from government and non-governmental organizations (Mensah and Antwi, 2002). Based on our interviews, the homeowner took a loan to obtain money for housing renovation and this debt will burden the family budget. The next responsibility of the society is handling funeral arrangements. The nearby public funeral area is located next to the sea and which is currently flooded by sea water and is part of the sea boundary. The residents should find another public funeral area, but this will incur extra transportation cost. The community can collect donations to support and help the mourning family for the burial. The third role of the society is to help the local government to identify and make a shortlist of the poor families. The shortlist is based on a criteria of what constitutes as a poor family issued by the government. This shortlist will be beneficial for policy making for poor society and will be issued in the information system of poor people (*Simgakin*). This shortlist also helped the main interviewee to locate respondents of this research.

Fig. 8 Balance between government and society role



Conclusion

The fisherman house is in average of 30-50 m², using conventional stone foundation, asbestos and scrap metal roof, unrefined bricks wall, and bare soil floor. Asbestos sheet for roofing is the preferred material because it is cheaper and last longer than clay roof. The houses are frequently inundated by tidal flood and seepage daily but the people have not adapted to the wet environment and still perform a land oriented living culture. Most of community use landfill or sand sacks to elevate the housing floor. Stilt structures are being used in the houses built by the government. Most of the houses do not have toilet at home and used public toilet built by the community and the government and have to pay extra cost for the service.

Housing renovation is still mainly done by the homeowner rather than a government effort. The role of the government is to provide physical infrastructure such as road, shipyard, tourism facilities and social health insurance. The community of Tambaklorok requires housing renovation, funeral arrangements and identifying shortlist of the poor family to assist the government in the policy making.

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