PRODUCTIVE HOUSING: DOMESTIC SPACE AND PRODUCTIVE SPACE WITH PASSIVE SOLAR ENERGY UTILIZATION

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ABSTRACT

Productive housing is an alternative being done for increasing family's economy. The existence of productive housing was caused some conflicts, one of them is the space conflict. Space conflict was due to overlapping between domestic needs and economy needs. This happens also in the research area, Kampung Sukolilo, which is famous with processed fisheries product. Space conflicts did not only occur in the house, but also occured at the surrounding. Conflict occurred due to the needs of economic space that was always increasing while the house was not able to accommodate for more. In addition, public space conflict also occured due to production process, the drying of fisheries products, which rely heavily on solar heat. This research is expected to observe the form of adaptability in utilizing passive solar energy in housing that could minimize public area conflict. To achieve the objecttives of this study, there are several steps that have been overcome include identifying the factors causing space conflicts and how much space conflicts that occured. Identification was conducted by interviews and field observations. From the research, it was found that the people in Kampung Sukolilo has done several innovations in their house and surrounding. The house orientation in Kampung Sukolilo is to north and south actually very beneficial for drying process. It is because the house will cast the shadow to other house not to cast shadow on the alley or drying area. The passive solar is applied in the house for reduce the humidity and for drying process.

Keywords: *drying process, passive solar energy, productive housing, space conflict*

ABSTRAK

Perumahan produktif merupakan ide alternatif yang dilakukan untuk meningkatkan perekonomian keluarga. Keberadaan perumahan produktif menyebabkan beberapa konflik, salah satunya adalah konflik ruang. Konflik ruang tercipta karena tumpang tindihnya kebutuhan domestik dan kebutuhan ekonomi. Hal ini terjadi juga di daerah studi di Kampung Sukolilo yang terkenal dengan produk pengolahan hasil per-

ikanannya. Konflik ruang tidak hanya terjadi didalam rumah, tetapi juga terjadi pada area sekitar. Konflik ruang terjadi karena kebutuhan ruang untuk kegiatan ekonomi yang selalu meningkat sementara rumah tidak dapat mengadomodasi lebih. Sebagai tambahan, konflik ruang publik juga terjadi karena proses produksi pengeringan produk perikanan yang sangat bergantung terhadap panas matahari. Penelitian ini bertujuan untuk mengobservasi bentuk adaptasi di dalam pemanfaatan energi matahati dalam perumahan yang bisa mengurangi konflik ruang publik. Untuk mencapai tujuan dari penelitian ini, ada beberapa langkah yang dilakukan termasuk mengidentifikasi faktor-faktor yang menyebabkan konflik ruang dan berapa banyak konflik yang terjadi. Identifikasi dilakukan melalui interview dan observasi lapangan. Dari penelitian, ditemukan bahwa penduduk Kampung Sukolilo telah melakukan beberapa inovasi di dalam rumah mereka dan area sekitar. Orientasi rumah di Kampung Sukolilo mengarah ke Utara dan Selatan yang sebenarnya sangat menguntungkan untuk proses pengeringan karena rumah akan menghasilkan bayangan ke rumah yang lain bukan ke area pengeringan. Energi pasif matahari diterapkan di dalam rumah untuk mengurangi kelembaban dan proses pengeringan.

Kata kunci: *proses pengeringan, energi pasif matahari, rumah produktif, konflik ruang*

INTRODUCTION

Kampung Sukolilo is part of coastal area in Surabaya City, Indonesia which is well-known as Prominent Kampung in Fishery Processed. This kampung has become a center of Home Based Enterprises (HBEs) in processing seafood into crackers and dry food. Kampung Sukolilo has the potential product to be developed which have been widely known and the natural conditions of the coastline which is rich in fishery resources. Their HBEs with traditional systems have been known for generations.

Drying on the ground level and take a lot of public space due to the lack of space availability is an issue in Kampung Sukolilo.The polluted area was unwell for the traditional seafood processing because it could produce less hygienic products.

THEORY / RESEARCH METHODS

Home-Based Enterprises in Productive Housing

A Home-Based Enterprise is a sub-group of the informal economy and focused on low-income neighborhoods (Ezeadichie, 2012). Moser cited that housing should be seen as productive assets to cope with poverty and the household as an intrinsic asset in strengthening the economy and poverty alleviation. HBEs has been able to transform dependent society into a society which is having personal resilience, especially when people have been able to organize and coordinate their own efforts (International Forum on Urban Poverty, 1997).

According to Silas there are five main characteristics of HBES (Silas, 2000):

1. House and household became the capital and the basic of family's economic activities
2. Family became the main forces in the organization of HBEs, ranging from setting up, running, to controlling all the activities, facilities and infrastructure involved
3. The principle and the working pattern of HBEs in relation to and as a part of domestic organization
4. House is a process that is always adapting to the context of activities happened. Home-Based Enterprises that it has been shown to increase the household income is also expected to assist in improving the quality of homes and human quality in it.
5. Various conflicts arise as a consequence of the HBEs in the house can be resolved naturally, both internally and conflict with the environment and neighbor who are involved in HBEs activities.

From the five characteristics of HBEs, it is more apparent that the development integrates the physical, social, and economic aspects initiatives and thus requires the participation of the households continuously.

RESULTS AND DISCUSSION

Productive House in Kampung Sukolilo

Figure 1 shows the area of Kampung Sukolilo. It can be seen that the houses directly adjacent to the beach. Besides, houses built closely to each other. So there is no space between houses.

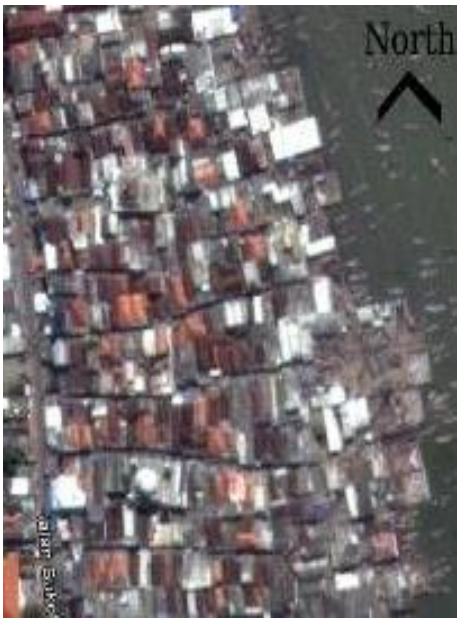

Figure 1. Coastal Area of Kampung Sukolilo

By relating domestic activities and productive activities in the house, there is a conflict for each activities in the space allocation conflict.According to Silas, there are three types of space uses of domestic area and productive area (Silas, 2000):

1. Mixed type: domestic area together with productive area are in a house and could not be separated. In this type, domestic function is still being dominant.
2. Balanced type: domestic area is separated with productive area but still in the same building.
3. Separated type: productive area is dominant and take the largest area from the total area in the house. Sometime, domestic area is placed behind or in front of productive area (it could be in different building).

The three types of productive house could be found in the kampung. Separated type productive house was mostly owned by bosses or large-scale seafood processsor. The other two, mixed type and balanced type, were mostly found and owned by most inhabitants in Kampung Sukolilo. Figure 2 to 4 show the floor plan of balanced type and mixed type of productive house.

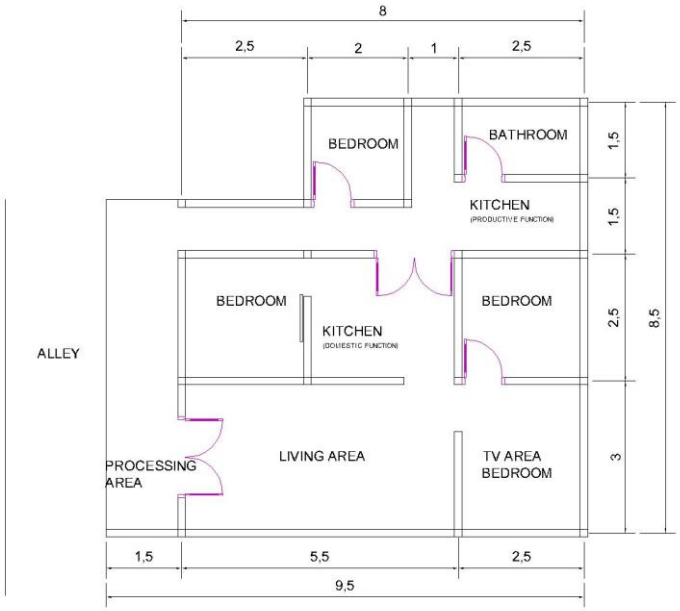

Figure 2. Floor Plan of Balanced Type

In figure 2, it could be seen that the dwellers had two different types of kitchen in the house. They had the kitchen for domestic used and kitchen for production used. Besides, just like others, they used terrace for processing area.

Different from figure 2, in figure 3 we can see that the dweller only had 1 kitchen in the terrace and 1 storage even though they had two different production activities. The production activities that being done by them were fishery processing and held a grocery store. Due to the lack of area within the house, they moved domestic area to 2nd floor and they could also dry the seafood on the balcony.

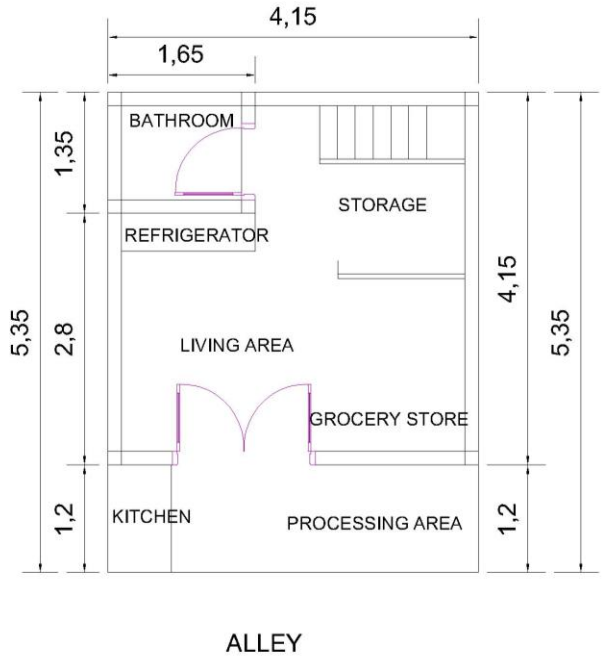

Figure 3. Floor Plan of Mixed Type (1st Floor)

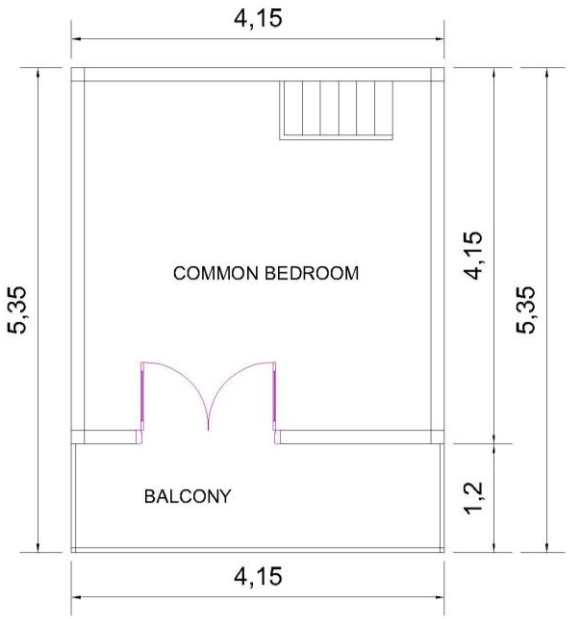

Figure 4. Floor Plan of Mixed Type (2nd Floor)

Space Conflict in Kampung Sukolilo

Kampung Sukolilo is one of the densely populated kampung in Surabaya. With the narrow house area, the seafood processing activities include domestic and production activities in the house. People use the space around the house with the purpose to extend or expand the work area (Laboratory for Housing and Human Settlement, 2002). Proven in Kampung Sukolilo that with the increase of space needs and mixed activities, the processor expandes the domestic and productive area using the public space, such as roads alley.

Kellett and Tipple (2003) distinguish "multiple uses" and "space conflict" based on the time frame of the activities conducted in a space. The term "multiple uses" is used when a space is used for several activities alternately. Slightly different, the term "space conflict" is used when a space is used for several activities at the same time.

Pedestrian ways in the alleys are important element in the sustainability of HBEs area (Laboratory for Housing and Human Settlement, 2002). Many production processes occurred in the pedestrian area. Starting from raw material processing to drying process, production processes were conducted outside the house area because of the fish smell. Area of the house which was used for economic activity usually limited to the storage function for the dried product.

Area used around the house and public spaces for production purposes had become common place among the seafood processors, especially for drying function. The seafood drying process took a long time until a few days to obtain a completely dry product. The washing process was carried out more than once. If the rains come, the drying process could reach a week. Figure 5 and 6 show the condition of pedestrian way in Kampung Sukolilo.

Figure 5. Kampung Sukolilo with the Pedestrian Way

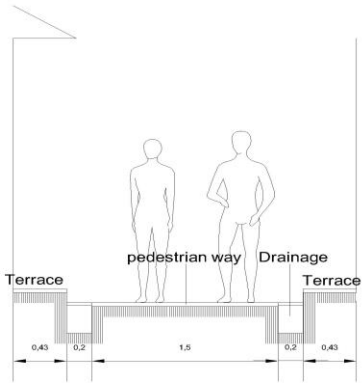

Figure 6. Section of Kampung Sukolilo Pedestrian Way

The drying area including processor's area, public areas, the street in front of the house, the area above the river, and drying area for kampung inhabitants. There was unclear physical boundary to distinguish the owner of the drying area. The absence of a physical boundary did not mean that there was no boundary of drying area. According to the respondents, the drying areas have been pegged and privately owned (except the public drying area). Although there were no written rules, but there has been agreement among the residents to set up the drying area. However, neighbors could also use the area for drying when the owners were not using the area for drying their product. Agreements and negotiations among the processors in Kampung Sukolilo have been done hereditarily and seems to have become one of their kinship culture (Bishop and Kellet, 200).

Figure 7 shows the land-used in Kampung Sukolilo. The *blue-colored* show Kampung Sukolilo area that being studied. The *yellow-colored* area show the space owned by inhabitant being used for private drying area. The *red-colored* show the public space that being used by inhabitants arround the space for drying process.

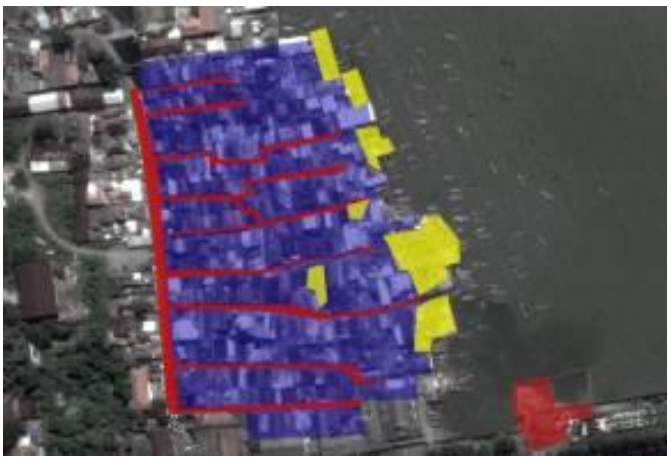

Figure 7. Kampung Sukolilo Land-Used

For the seafood processors with limited space and did not have specific area for hang drying usually did the process on the street in front of their houses. Such processing and drying of products have occurred down through the generations and problem never occur among residents. However, drying in a public area like this interfere the pedestrians and vehicles through it. In addition, hygiene was not guaranteed (Fig.8).

Figure 8. Drying Process in Public Area

Public drying area, showed in figure 9, was provided by Ria Kenjeran Tourism Beach manager for seafood processors from Kampung Sukolilo. Unfortunately, most processors could not dry their seafood there because the area was controlled by several processors arround it. Even there was no agreement who could use the area and no owners boundaries, most processors who did not use it said that they did not dry their product there due to the far distance between their house and the public drying.

Figure 9. Public Drying Area Provided by Ria Kenjeran Tourism Beach Management

Passive Solar Energy Utilization for Economic Activities

The drying process is highly depend on solar energy. This encourage people to create innovations in residential and public spaces to meet the housing needs for drying. Simple innovations were done by the seafood processors because the lack of knowledge and the economic conditions were still relatively low. With simple innovation, the processing of fishery products was still limited to ground level and drying on raised rack system. But here the drying was done horizontally so that need a lot of space, including public spaces such as roads, river banks and alleys of the settlements.

Ground Level Drying

This drying system was mostly done by the seafood processors who do not have drying area. Wet processed product laid on the rack and then put away on the ground level. Ground-level drying was more mobile because it only requires a rack without the existence of a permanent tool or installation for drying (Figure 10 to Figure 12)

Figure 10. Ground Level Drying

Ground-level drying mostly found in the narrow alleys. There was a tilt rack in the diagonal shape and faced the direction of the sun. In the morning until nearly noon, rack exposed to the east, while the rest of the day amid the rack exposed to the west.

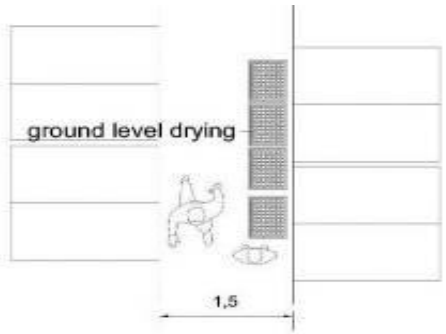

Figure 11. Ground Level Drying

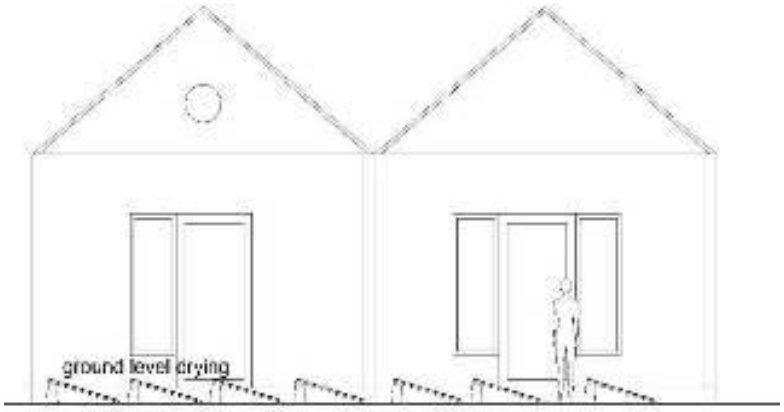

Figure 12. Ground Level Drying Section

Raised Rack Drying

This drying system was most commonly found in Kampung Sukolilo. Raised-rack innovation also the most visible. Starting from a simple raised rack until the permanent raised rack. In theory, raised drying rack could dry food more quickly because the air could flow from the bottom of the rack.

Raised drying rack with innovations,like the one below (Fig.13), was the most common. Innovation was usually performed by the seafood processors who have large drying area. Raised rack frame was made from bamboo and fitted with a height of approximately 2 meters so that people could still walk under it.

Figure 13. Raised Rack Drying

There was another raised rack innovation that was installed in public spaces areas. In this case, raised rack was installed above the alley. The processors arranged some bamboo shoots from one roof to another roof. Raised rack was installed on the

river and above the narrow alleys also accomplished by processors who do not have large land, showed in Figure 14 and 15.

Figure 14. Raised Rack Frame on a Narrow Alley

Figure 15. Raised Rack Frame Above the River Banks

Figure 16 below shows that most houses in Kampung Sukolilo only have 2 main orientations, north and south orientation. Besides, sun orientation is from east to west. Due to this existing condition, left and right houses will overshadow each other and houses will not cast shadow to the alley and yard.

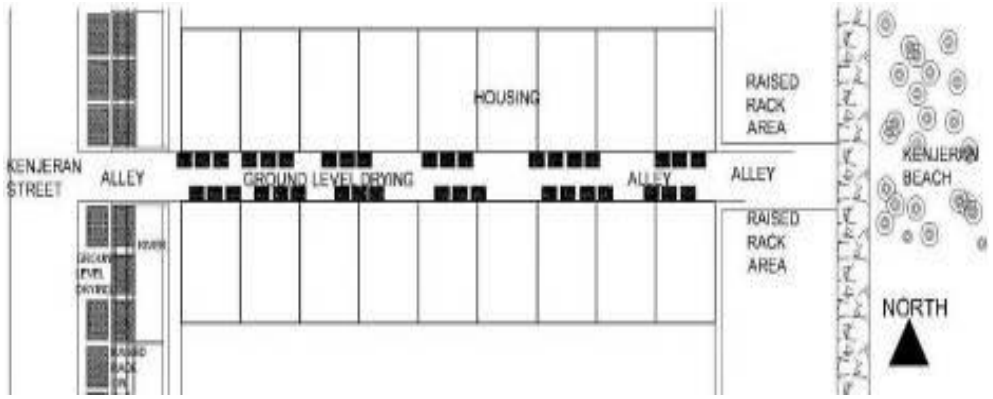

Figure 16. Lay Out of Houses in Kampung Sukolilo

Community Planning System

Community planning system related with how to develop the community through public involvement and participation. Lawanson and Olanrewaju (2012) stated that

community development is the empowerment of people, of organisation and of communities to attain or restore viability. There were many organizations held in Kampung Sukolilo but only several that was active. Kampung Sukolilo have family welfare empowerment, pray society, youth organization, capital loans foundation, and so on. Unfortunately, most inhabitants did not exploit these organization well because they did not have time and did not get benefits from it. Most of them only join the pray society .

There were approximately 30 houses with 70 householders in a neighborhood (an alley) and lead by a chairman. The chairman be in charge to organize most systems in his neighborhood include planning systems and conciliate among his neighborhood members.

One issue in this paper was about the space conflict among inhabitants particularly for drying space or drying area. There was no organization or leader who arrange drying space in Kampung Sukolilo, even though there were several quarrel happened. So far, they only arranged the drying area with some agreement among land owners. For inhabitants who did not have drying area, they could dry it in front of their houses, in public drying area, or use their neighbor's drying area. All of these process happened hereditary only with an unwritten agreement.

Most inhabitants could not use the public drying area for drying process because people around public drying area monopolize it. The public drying area was centered at one place so it was difficult for the processors who live far from the drying area to reach it.

CONCLUSIONS

Drying process is one part in a production process that requires a lot of attention, especially in terms of cleanliness. It is important to ensure product quality. Kampung Sukolilo with high production values are still using traditional drying process and tend to be less hygienic because the kampung has direct contact with the outside polluted air.

Most activities were done outside the house by the inhabitants during the day. We could see their activities being done in terrace and house surrounding where the production procces happened also.

The processors of fishery products in Kampung Sukolilo has made several innovations related drying innovations but they still do less. Ground level and raised rack drying that take quite a large residential area cause high conflict between the domestic area, production area, and public areas. In addition, drying in the open space could not be done during the rainy season. If a sudden rain, the processor must move the drying rack quickly. In the rainy season, drying can take up to one week. This is particularly noticeable in the study area where most of the drying process being done on the road and housing alley as well.

Community planning system like organization which is usually could be a power for enabling and enrich a community only have so little effect in solving Kampung Sukolilo problems. This is evident in public drying area conflict which is still unsolved. Thus, it need a specific organization for arranging drying system in Kam-

pung Sukolilo. This organization could help the community especially those who do not have drying. Furthermore, specific organization for healthy home is needed to persuade people making their house healthier. The most important is all effort have to be done by themselves because it is their houses and neighborhood. So, it need to increase the sense of belonging and responsibility of Kampung Sukolilo community.

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