HOUSING CHARACTERISTIC IN PALANGKA RAYA LESSON LEARNING FROM MITIGATION AND ADAPTATION PROGRAM

Mandarin Guntur[1]

Abstract

Lesson learning from mitigation and adaptation program on urban housing area in Palangka Raya is an advance urban housing development effort to cope extreme global climate change. This study is aimed at explaning adaptation and mitigation pattern on urban peat swamp housing area dealing with climate change according to local people approach and government approach. With comparing through mitigation pattern and adaptation pattern which have been implemented by government program and by local people on urban housing area, the level of adaptation and mitigation on urban housing area can be assessed. The result of the study shown that variability of adaptation and mitigation on certain housing area will be increasing the adaptation and mitigation of its urban region to cope global climate change.

Key Word : *adaptation, mitigation, peat swamp, housing and urban area.*

INTRODUCTION

The level of adaptation and mitigation on certain urban regions are determined by the number of its region wide range that has ability responded to reduce global climate change impact on urban housing occupant continually. On one side, certain regions are determined by its settlement and its hinterland. Hence, its settlement and its potency on certain regions are source for adaptation and mitigation dealing with climate change. Meanwhile, global warming triggers climate change and influences significantly to human life on earth. Climate change has caused rain pattern change, sea level rise, hurricane and high tide, and other impacts which have caused human life harmful as well. Climate change makes people choose to hide from natural environment that will be worse their life directly (ADB Report, 2009).

Daily activities and GHG require earth temperature increased since industrialization decade in England. According to prediction, earth temperature will be increasing about 20F in 21st century. It has indicated that human living needs an approach to harmful factors which has influenced global warming in order to decrease GHG emission on atmosphere. Increasing the emission of atmosphere since industrial revolution has been indicated that it is as a product of human activites. It includes CO2, chorofluorocarbons, ozone, nitrous oxide (N2O), methane (CH4) where CH4 and CO2 are two big concentrations of GHG that consist of 36% and 148%. All those happen have been caused by fosil consumption and land use change such as peat swamp lost

[1] Tenaga Pengajar Jurusan Arsitektur Universitas Palangka Raya

on wetland and deforestation. On wetland has been predicted that 771 billions ton of GHG or 1/5 of the total number of world carbon are preliminary decreasing (IPPC, 2007).

Mostly land use change in the world has been caused by watering on wetland for development, farming, and other function that has been saving and accumulating carbon for long time as a source of GHG. By natural process such as organic decomposition in soil, wetland has released CO2, CH4 and N2O. CO2 not only as a result of anaerobic process and microbial aerobic process but also it come from seed respiration (Reddy, 2008). CO2 on atmosphere by natural process can grasp self balance through many kind process colectivelly. It is custome in carbon cycle. The earth naturally has capability absorbed and released CO2 within GHG process on atmosphere (IPPC, 2007).

In order to protect as well as to hide the impact of climate change directly, people on certain location have delivered various kind efforts to get better living that away from extreme climate change influence. Therefore, adaptation is important for people to be able to live side by side with climate change and to be able to adapt global climate change, particularly on certain housing. Housing areas are not only for human occupancy in that includes houses and its facilities but also spatial neighbourgh that has been formed by forest, corps, and farm land belong to people who live around the river, the lake, and the hill.

When forest and river surrounding settlement damage the flood occur as well as its housing pattern will be positioned change. Meanwhile, when corps, farm land and hinterland of the settlement burning by heating, the smoke is arouse being followed by some diseases and suffers contaminate the occupant of settlement. Therefore, housing on rural and urban area, particularly on peatswamp area has suffered by twin potency of environmental harmful such as flood and smoke. Significancy of global climate change on later decade adds sensitivity on environmental and on settlement which has been settled on peat swamp area.

ISSUES IN PALANGKA RAYA

Palangka Raya is capital city of Central Kalimantan Indonesia rounded by peatswamp, rain forest and long river of Kahayan, Rungan and Sabangau. Administratively 30% of the city has been occupied and built for human settlement. Whilst, the other function of land use is protection forest and national park of Sabangau. Land use in city center distributes into zones for human settlement, office, service and trade. Housing is a larger portion for its land use. It can be recognized as city center housing, riverside housing, and forest edge housing.

The first, city center housing in Palangka Raya can be categorized into three type characteristic such as massive density housing, middle sparse housing, and sparse housing. Massive density housing is custommely populated by low income with slum and irregular housing. Middle density housing is houses between massive density housing and sparse housing practically in those houses populated by middle income in this type can be seen to be massive density housing depend on it's inhabit characteristic. If housing occupants are well educated people who obeying the law, their housing will regular and formal but if housing occupants aren't well educated

people, their housing will irregular and informal (Guntur, 2008). Sparse housing is houses custommely populated by high income, in this category the houses custommely regular settlement and formal, meanwhile the occupant of these houses are frecuently tax payer. So, government recommended to all housing occupants making up of their houses in to this characteristic.

The second, riverside housing in Palangka Raya can be recognized in to two characterized such as float housing and rigid housing on the riverbank. Float house is custommely called *lanting*[1]. Ussually, this house is built for small family or for bachelor. Therefore, the building isn't a larger and never be built for storey houses. Shortly, this is an unplanned housing that people who occupied on this building certainly doesn't own formal housing on landform. Hence, building design custommely used the biggest tree or the biggest container which able to float stablility on the river or on the lake. Meanwhile, rigid housing on riverbank has characteristic as a stage house which is constructed by wood materials created from sub construction to roof top, custommely populated by low income and low education people. Sometime a house is populated by middle income that pays no attention to the law.

The last one, forest edge housing in Palangka Raya is a house custommely populated by people that needs a wider land for cultivation and crop for business. But sometime this housing populated by low income that left their lanting house or riverside house move to forest edge housing as a family or a person who attempts land crops or as a land subdivider. Differ from other housing characteristic locations, in this housing people who built their houses made a single house. After their occupied and dominated the land as subdivider, hence they sell the land to other people, it can be a private, a company or a housing developer who have took the land. Shortly after this action a house pattern become change in to cluster housing, the city develop into horizontal wide then forest cut and burn immediately occur.

METHOD

Adaptation is seeking to adjust the built and social environment to minimize the negative outcomes of now-unavoidable climate change. Meanwhile, mitigation planning works to reduce current and future greenhouse gas emissions, includings emission that are generate through the built environment and transportation sectores. Hence, mitigation and adaptation must be treated as twin issues (IPCC, 2007a: p.65 in Hamin & Guran, 2008). Adaptation that works self implemented autonomously by private sector in order to response current climate change without government policy intervention, it is noted as autonomous adaptation. Other action that was implemented as the result of carefully decision, noted as planning adaptation or triggered by policy. Adaptation also reactive which mean it is implemented to response current climate change impact or called as proactive to anticipate climate change. Adaptation has characteristic as technique that mostly part of adaptation is technical solution or non technical where it is depending on policy change, institution and behavior.

[1] Lanting is traditional language (Dayak Ngaju) for floating houses or buildings which it is floating on the rivers or lakes.

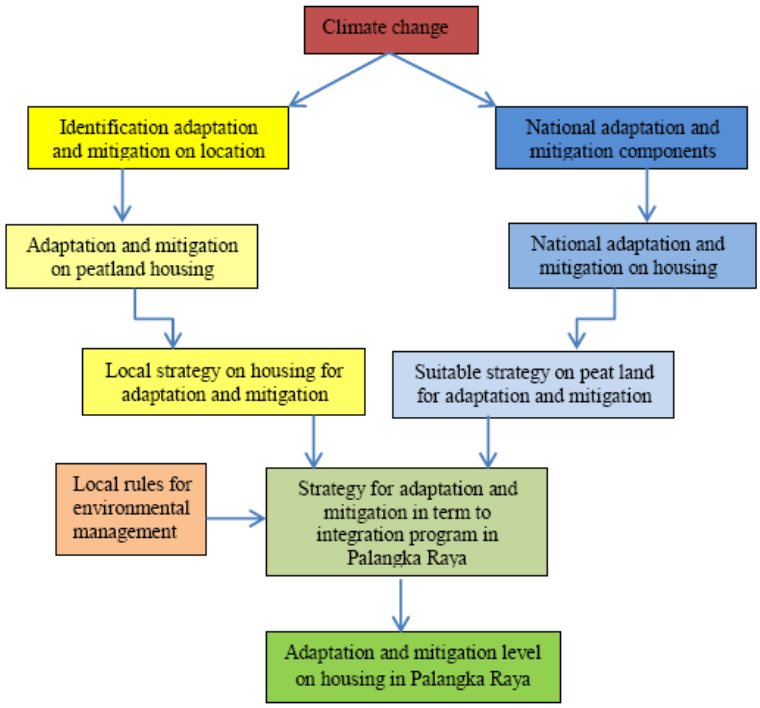

Figure 50.
Framework Concept

Learning from mitigation and adaptation on urban housing

To learn mitigation and adaptation on urban housing some reviews was published in term to get simple framework regarding adaptation and mitigation. The United Nations Framework Convention on Climate Change (UNFCCC) uses two significant terms: mitigation, which is aimed at reducing emissions to minimise global warming or 'avoiding the unmanageable', and adaptation, which is 'managing the unavoidable' (GTZ/PIK 2009). While neither mitigation nor adaptation measures on their own can prevent significant climate change impacts, taken together they can significantly reduce risks. Parry et al. (2007) and Klein et al. (2007) show how adaptation and mitigation measures are mutually re-enforcing and thus should not be considered in isolation (Snow and Prasad, 2011).

Baum et al. (2009), makes a simple distinction between mitigation and adaptation, where 'climate friendly' development (mitigation) leads to low greenhouse gas emissions and 'climate safe' development (adaptation) leads to low vulnerability to direct (temperature and water) and indirect (flooding, saline intrusion) effects of climate change. While mitigation efforts are clearly important in terms of slowing the rate of climate change, given the climate system has already changed, and will continue to do so irrespective of mitigation efforts, at least in the short to medium term, investment in climate change adaptation is a prudent course of action. An adaptation approach acknowledges that there will be a need to adjust to unavoidable climate change to minimise building and infrastructure upkeep costs and maintain healthy ecosystems and liveable urban areas (EDG, 2011.p.3).

 ISSN 1907 - 8536

In Central Kalimantan adaptation and mitigation has been implemented into certain sector which is influenced by climate change on certain region including urban housing. On housing sectors, government has implemented some programs that include official advices and housing infrastructure development such as *building arrangements and environments, national building management, infrastructure for sanitation development and trash, and clean water development*. All those programs have been implemented through sector on regencies and provinces. Mitigatian and adaptation on urban housing needs collaboration between all sectors and institutions either from central institutions or from local institutions that should be continually making partnership with occupant of urban housing. There is a gap between government institution program concerning on adaptation and mitigation on urban housing and local resident need. Therefore, programs which are come from government both national and local cannot match to the occupant of urban housing completely. Variability of the adaptation and mitigation on urban housing can be seen in the table below.

Table 7.
Housing characteristic learning from self Mitigatin and Adapatation in Palangka Raya

Type	Characteristic	Construction	Mitigation	Adaptation	Threat
City center Housing	Massive density housing	Mix concrete, wood	Self provide: pathway fire protection **clean water** few lighting trash box house	Few small windows[2] Few small doors metal roof wood construction single small house bicycle concrete floor Wood floor. **Outside toilet**	Weather tropical Cyclone Fire trash product sewerage jammed drainage shallow Smoke. Rotten (wood) disease
	Middle density housing	Mix concrete, wood	Self provide; Clean water Trash box	well-matched: floor, windows and doors site Plant	Weather tropical Cyclone Smoke Drainage Rotten (wood) disease
	Sparse housing	Mix concrete, wood	Self provide: Trash box	well-matched: floor, windows and doors site Plant	Weather tropical Cyclone Smoke Rotten (wood) disease
Riverside Housing	Floating House (FH)	wood	Self provide: clean water Lighting Pathway Lanting (FH)	Material constructed by wood, it is easier to change. Design into small and single storey building, Few small window and door.	Tropical Cyclone Smoke Weather Tides Rotten disease

[2] Local resident built their housing limited ability to spent construction materials

Type	Characteristic	Construction	Mitigation	Adaptation	Threat
	Rigid housing on the river bank	wood	Self provide: Clean water Lighting Pathway Trash box	Few small windows Few small doors metal roof wood construction single small house motor cycle bicycle	Tropical Cyclone Smoke Flood Fire erosion Rotten disease
Forest edge Housing	Single house	Mix concrete, wood	Self provide: Clean water Lighting Pathway Waste box	well-matched: floor, windows and doors site Plant	Tropical Cyclone Smoke Weather No sewerage No drainage Fire seep into the ground Rotten (wood) disease

Table 8.
Housing characteristic learning from mitigation and adaptation Strategies

Type	Characteristic	Construction	Mitigation	Adaptation	Weakness
City center Housing	Massive density housing	wood	Provide: **Fire hydrant** **clean water** **Toilet (IPAL)** Wood pathway **Solar Ligthing** Concrete pathway	***Movement program*** ***Land consolidation*** ***PNPM Mandiri*** ***P2KP*** ***KIP*** ***Migration (Transmigration)*** ***Clean Development Mechanism (CDM), others***	**Movement program**: dismatch to ocuppants **Land consolidation**: not entire occupant meet to the program **PNPM Mandiri**: ongoing program that only separately help occupant to fulfill the need of housing. **P2KP** not entire occupant meet to the program, it needs sustainable program. **KIP** only running when formal institution can provide and manage informal institution on housing occupant. **Migration** not entire occupant follows this program with any reasons3

ISSN 1907 - 8536

Type	Characteristic	Construction	Mitigation	Adaptation	Weakness
	Middle density housing	Mix concrete, wood	Provide: clean water electricity, Fire hydrant. Solar Ligthing Street Land secure	Land consolidation, zonning regulation, land use regulation	program meet occupant
	Sparse housing	Mix concrete, wood	Provide: clean water electricity, fire hydrant, wide street, land secure	Land use, zonning regulation regulation	program meet occupant
Riverside Housing	Floating House (FH)	wood	Urban regulation on river bank	***Movement program*** ***PNPM Mandiri*** ***P2KP*** ***KIP*** ***Migration (Transmigration)*** ***Clean Development Mechanism (CDM)*** ***others***	Grow naturally, No program meet occupant
	Rigid housing on the river bank	wood	Provide Fire hydrant clean water Toilet (IPAL) Wood pathway Solar Ligthing Concrete pathway Wood pathway	***Movement program*** ***Land consolidation*** ***PNPM Mandiri*** ***P2KP*** ***KIP*** ***Migration (Transmigration)*** ***Clean Development Mechanism (CDM),*** ***others.***	**Movement program**: dismatch to ocuppants **Land consolidation**: not entire occupant meet to the program **PNPM Mandiri**: ongoing program that only separately help occupant to fulfill the need of housing. **P2KP** not entire occupant meet to the program, it needs sustainable program. **KIP** only running when formal institution can provide and manage informal institution on housing occupant.
Forest edge Housing	Single house	Mix concrete, wood	Housing Led Economic development	-	No program meet occupant

The gap between local resident and government strategies regarding mitigation and adaptation on urban housing can be seen on the table above. When threat occur the mitigation and adaptation framework that come from planning cannot reach to the resident of urban housing entirely and quickly only certain programs that well-matched to urban housing occupant. Let we look into sample assess below:

Mitigation approach on massive density housing, resident self provide pathway (concrete or wood pathway), fire protection, clean water, lighting, trash box and its houses. Meanwhile, on adaptation approach, the resident also provided few small windows and doors, wood floor, single small house, metal roof, outside toilet. All those adaptation and mitigation on urban housing are supported by government programs such as fire hydrant clean water, Toilet (Ipal), wood pathway, solar lighting, and concrete pathway within mitigation program and Land Consolidation, PNPM Mandiri, P2KP, KIP, Migration, and CDM within adaptation program. At the same time all those things face weather, tropical cyclone, fire, waste product, sewerage jammed, drainage shallow, smoke seep in to the ground, rotten cause it is wood construction, and desease. On one side, the resident needs anticipate as quickly as possible but the government cannot do it as fast as posibble, because government planning has no continually to pay attention regarded the program which have been implemented on the housing area. Therefore, certainly not all government programs will be well accepted by resident of urban housing. Weaknesses come from government will influence to occupant of urban housing that has low capacity to cope global climate change.

CONCLUSION

Housing designer should be pay attention to occupant of urban housing in terms to fulfill their basic need to adapt global climate change.

Adaptation and mitigation that comes from autonomous, absolutely has weaknesses which cannot be solved by private completely. Then, planning both adaptation and mitigation from governement can complete to urban housing. However, planning adaptation and mitigation needs spare time but it will be complete when private autonomous can accept planning framework as apart of their solution.

All stakeholders take into account to speak and to make reconciliation how to choose which one of the best solution to do adaptation framework and mitigation on certain urban housing location.

Variability of the adaptation and mitigation on urban housing can discover new solution to adapt extreme global climate change on urban housing lively days, particularly for people who live on urban peat swamp which is sensitively to climate change.

 ISSN 1907 - 8536

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