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P.A.C PROJECT

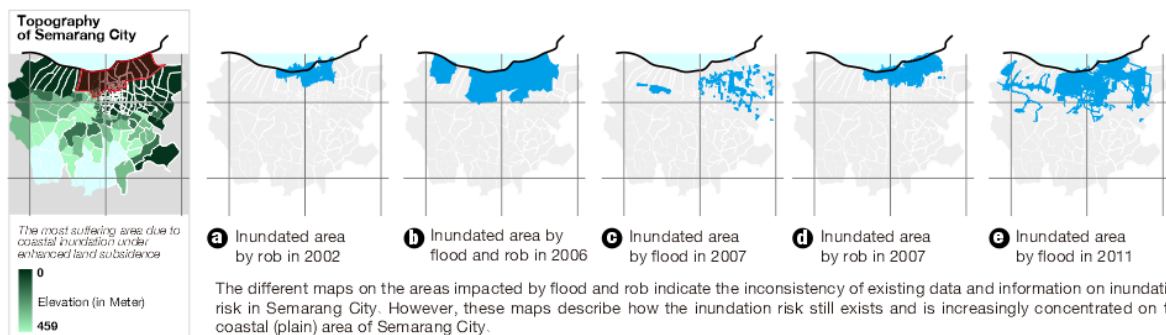
Is For Communities To Be Prepared, Adapt And Cope
With Uncertain Risks

“Urban Renewal And Community Development Project
Toward Coastal Hydrological Risk
Kampung Kali Bahru, Semarang-Indonesia”

INTRODUCTION

THE COASTAL CITY OF SEMARANG, Indonesia

Semarang City is one of coastal cities in Java Island which is most densely populated island in the world. 1 It is one of the biggest cities in Indonesia with a population of approximately 1, 584, 068 inhabitants in 2014.2 As capital of the Central Java Province, this city plays a central role in the economic development of the region. Moreover, it was designated by the national government to be one of the economic centres on Java Island and to support the national development in particular industrialization and services provision between 2011 and 2025.



Most of the flood-impacted areas are located in the northern part (coastal area) of the city. Furthermore, the central southern part of city was also threatened by flood due to the overflow of river water during the rainy season. As a consequence, North Semarang is highly vulnerable to flooding.

MAIN ISSUE

Cased Study:

KAMPUNG KALI BAHRU-SEMARANG CITY

Kampung Kali Bahru, is located on the south west part of Bandarharjo. Bounded by Jalan RE. Martadinata at the north, Jalan Lodan Raya and Kali Semarang, the Semarang River at the west, and Jalan Yos Sudarso and the Kalibaru at the east, the area is particularly vulnerable to various hazards, shocks and stresses related to climate change such as tidal flooding, land subsidence, sea-water incursion and rising sea levels, risks that threaten and take place frequently in the neighborhood.

SINKING BY FLOOD AND DROUGHT BY WATER SCARCITY

Flood risk in Semarang City is caused not only by the lack of urban drainage system to accommodate water discharge in particular during the rainy season, but also by the effects of high sea tides in particular on the coast. Rob often threatens this city since the mid-1980s because of industrialization and the rapid growth of population. The activities in the port and the industrial zones accelerate the urbanization in Semarang by increasing the number of settlements and extending the urban area. The construction of urban areas increases the water runoff by reducing the amount of ground able to absorb rainfall. Flood risk, the rob in particular, disturbs urban activities while communities and their environment are more and more vulnerable

MAIN CONCEPT

P.A.C PROJECT

Our proposal aims to establish the urban resilience of coastal communities from natural disasters and risks that can not be predicted. In its solution, the anticipation phase before the disaster is necessary to reduce the risk / greater impact. In this project, there are 3 anticipation phases before the disaster, there are Prepare, Adapt, and Cope trough zero energy living so the people have resilience to the unpredictable condition / uncertain risk of coastal areas. Through these phases, our proposal is feasible approach to reach the environment, community and urban resilience. we wish the community would be developed in zero energy, green and sustainability living to create a decent life and decrease the risk of coastal area. Illegal land in kampung Kali Bahru would be transferred as a open space, urban farming and infiltration area. The community who lives on illegal housing would be moved in the vertical housing that keep an urban principles, so accustomed to the landed community is able to adapt quickly in a vertical community.

PHASE 1: PREPARED

"Preparing the environment trough the land-use planning to fix urban slum by intervene the green dan blue infrastructure."

The rapid and unplanned settlements areas in Kali Bahru caused enviromental and ecological degradation. It increases the water runoff by reducing the amount of ground able to absorb rainfall. When high sea tides and rainy season are coming, there is no more green area to accommodate water discharge. It is why Kampung Kali Bahru has high risk of sink and drought.

First phase is preparing the environment through the land-use planning to fix urban slum by intervening the green and blue infrastructure. The purpose is to relocate the potential weak spot and failure such as illegal and not livable settlements into a green and blue infrastructure to increase more of green spaces and water discharge area.

GREEN INFRASTRUCTURE

Providing Green Spaces: Green Infrastructure is a network of green spaces providing various ecosystem services. Urban forests, tree stands, and garden, for example, provide protection against erosion by floods, and drought.

BLUE INFRASTRUCTURE

Runoff Reduction: Blue Infrastructure generally refers to green spaces that include water for regulating hydrological flows. Blue infrastructure is increasingly being utilized for storm water management, mimicking the natural infiltration and runoff reduction functions of natural ecosystems. sand filter and permeable pavements are a few examples.

Improved Water Quality: The proposed to improve water quality is through the filtration strategy. The planters collect and filter wastewater through layers of mulch, soil and plant root systems, where pollutants such as bacteria, nitrogen, phosphorus, heavy metals, oil, and grease are retained, degraded and absorbed

PHASE 1 GOALS:

These green and blue areas perform a range of ecosystem services essential to quality of life in the city and ensure a high level of resilience, including:

- Supporting biodiversity
- Reducing flood risk by absorbing and temporarily retaining rainfall
- Moderating the temperature by offsetting the urban heat island effect
- Reducing energy demand by providing shade and reducing wind speeds
- Helping to reduce noise and air pollution
- Providing places for recreational and leisure activities that improve health.

PHASE 2: ADAPT

“Adaptation of society to a new and better environment, to improve community resilience and quality of life.”

The revitalization of the environment that has been done in the previous phase needs to be balanced with the adaptation of the community, from the adjustment of the dwelling house, the development of open space as a social space and the adjustment to the potential of the village. The purpose of this phase is to create community resilience in social and economic aspects

MAKING A SOCIAL ACTIVITY

Providing Public Space: After Phase 1 is done with Land use planning is expected that illegal land is used for green space. Then in Phase 2, green and open space is developed for social space. This space aims to change the social conditions of isolated communities and enhance the social and environmental sensitivity of the people.

QUALITY OF LIVING

Vertical village: In the one step before, the illegal land is transferred into the green and blue space, so the people who lives on illegal land and risk areas, are moved to a vertical house in a safer area. This vertical house is designed with an urban principle, unifying the potential of the environment and applying the principle of disaster prevention.

PROSPERITY AND ECONOMIC RESILIENCE

Market Society: Kampung Kali Bahru has great potential in the fisheries sector and fish processing industry. But this potential has not maximally become the wheels of the economy of society. The role of Market Society is needed to increase people's income and enhance the prosperity and economic resilience of community.

PHASE 2 GOALS:

- BETTER LIVING
Improvements in terms of environment and society will give a good impact in the growth of community resilience is expected to build a better life and create an independent society.
- SELF-SUSTAINABLE ECONOMY
- SELF-SUSTAINABLE SOCIALITY

PHASE 3: COPE

"Protection and anticipation when an Unpredictable disaster happen, Through the addition and improvement of Infrastructure system."

GREEN PUBLIC SPACE

1. Water management:
2. Energy management:
3. Waste management:

CANALS

1. EMBANKMENT PROTECTING SYSTEM

Temporary Wall: Movable flood protection can supplement protective walls when there is a threat of flooding. Movable elements are only used temporarily, during period of high water. Closeable gaps are installed that are precondition for use of open space in front of the protective walls

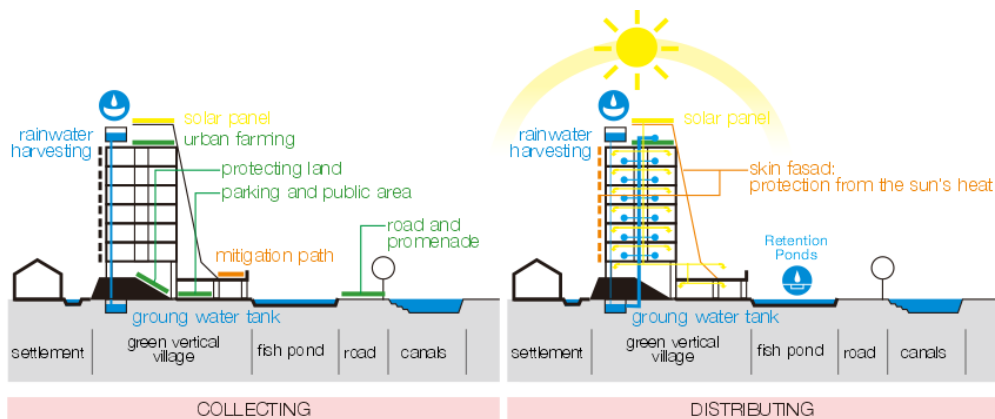
Differentiating Resistance: Differentiating the riverbank create more space for the water to spread sideways. This is achieved by terracing the riverbank walls. Terrace make resistance to erosion. Height of the terraces determines level and frequency of flood. Different fluctuation give anticipation every day when high water.

2. INTEGRATED DRAINAGE CANAL

Connecting the open space and river: Open space serves as a water reservoir, so its needed an integrated channel system to deliver residual water that is not directly absorbed into the main canals/ river

Sluice to set the height and irrigation of water: Open and close system is applied in the form of sluice to arrange water irrigation to the settlement. This water gate also serves as a turbine to generate electrical energy

GREEN VERTICAL VILLAGE



CONCLUSION

PAC Project is our proposal to see the problem through 3 phases with zero and sustainable energy approach in each phase. The first is Prepared, a phase to restore environmental functions through green and blue interventions, then Adapt, a phase of human social adaptation to its new environment for a better quality of life.

And the last is Cope, a phase of improvement of infrastructure system for protection when disaster happen. Our hope is when the environment and human are already strong with the support of adequate infrastructure system, this city can be resilience!

"When we think first to the environment and then the people, it can make a strong emotional connection between human and their place."