SEGMENTAL DEVELOPMENT DESIGN FOR WONOKROMO WATERFRONT SETTLEMENTS AT SURABAYA

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Abstract

Wonokromo River lies from south-west of Surabaya, connection to Brantas River as a main river. Wonokromo River has two main functions are as raw water of water supply consumption for Surabaya inhabitants and main city drainage to control flood during rainy season. At past Wonokromo River was functioned to provide water irrigation for agriculture and was changed to be main drainage for Surabaya City. Along both side of this river banks lies thousands informal settlements and some home industries. Research of river capacity in 2002 indicates that one third of Surabaya city will be threatened by flood because narrow of Wonokromo River cavity, thickness of sedimentation and density of settlements on the embankment.

The problems to resettle community are none of community wants to move from current settlements, and some households have legal status of identity. Many households occupied riverbanks more than 20 years and none of local government officer evict them. Problems of river physical condition are having various depth of river ground and various wide of river sections.

Method to solve the problem to arrange settlement by using concept "community guarding river" to meet technical solution by using planning principle of: (i) government and community agree to minimize eviction and building demolition, (ii) designing settlements arrangement based on different segment of river technical condition, (iii) community participate to share idea for technical solution to arrange their own settlements based on segment condition, (iv) household economic activities should be considered to rearrange and increase the economic potency and maintaining river function as water resources.

Keywords: *community guarding river, segmental design development, settlements arrangement*

I. BACKGROUND

Wonokromo river is a branch of Surabaya river lies along Wonokromo Sub-district to the coastal area in Wonorejo Sub-district of East Surabaya Area. Wonokromo river become important issue after Surabaya experience three difficulties problems; flood, river maintenance for water resource and informal settlements sprawl along river.

Study of flood prone area based on flood cycle 100 years will affect to more than 10 thousand houses are inundated; flood cycle 50 years will drown over 5000 houses; and flood cycle 25 years will remove about 3000 houses. Based on

survey by ITS (2002) at least 2099 households are settled along riverbank of Wonokromo river since 1950s. About 594 of it have been evicted and resettled in walk-up flat nearby and the rest are still exist until now. The numbers of households are equal to houses at Wonokromo embankment.

The study based on technical and social approaches propose that eviction should be minimized by segmental settlements and resettlements design by community participatory planning.

II. EXISTING OF WONOKROMO RIVERBANK SETTLEMENTS SITUATION

Informal settlements along Wonokromo riverbank was initiated since 1950s. There was no law enforcement to control abandoned settlements until Surabaya has got flood problems. Study conducted by ITS and The Province Government (2002) found that about 66,6% of dwellers are originated from Surabaya, 19,9% are from cities and towns within East Java, 8,1% are no identity, 3,9% are temporary identity, and 1,5% are from other provinces.

Most communities occupied land of embankment with no permit (92,7%), 2,6% with informal land status (Petok D) and the rest of them with permit from the Province Department of Irrigation, and Surabaya City Government. About 53,4% settlements are for living places, 29,3% are for informal home-based economics, 15,2% are for low to middle economic activities, and the rest of it are with no activities.

These settlements are sub-service standards of basic infrastructure and services provision from local government because the 'illegal' status. There are no education facilities, communal clean water taps, and communal sanitations. These informal settlements are grouped based on local neighbourhood social connection system. These settlements social connection system lies from Gunungsari Sub-district to Wonorejo Sub-district.

III. PROBLEMS

There are four main problems of physical, technique, law and social arise along Wonokromo river banks settlements.

a) Physical problems:
   - Settlements will expand unrestrained and risk to secure and environmental life.
   - The next generation dwellers will experience decline of comfortable and environmental degradation as a consequence of extensive congestion of settlements.

b) Technique problems:
   - Wonokromo river current capacity will decline to 200 m^3/second of 350 m^3/second optimum requirement to control flood.
   - River mean of functional treatment and control will obstructed by settlements expansion to river banks.

c) Law problem:
   - The existence of settlements on the river banks against the local act concerning of land status.

d) Social problems:
   - The risk of poverty and social distress will continuously increase to deteriorate dwellers living.

- There are many different groups of community that have different social and culture structure that shape the living situation that should have different solution of resettlements in order to preserve the river functions.

IV. RIVER TECHNICAL ASPECTS IMPACT TOWARDS SETTLEMENTS

Wonokromo River is a branch of Brantas River that has main function to control flood and source of water consumption for Surabaya inhabitant. Current situation of Wonokromo water level is higher than Surabaya ground level. Therefore the river embankment is being built 1.00 to 3.00 metre height above the street level.

Surabaya experienced increasing flood prone area since city built-up area improve very fast yearly since 1990s. Research of river capacity in 2002 indicates that one third of Surabaya city will be threatened by flood because narrow of Wonokromo River cavity, thickness of sedimentation and density of settlements on the embankment.

Surabaya has a lot of drainage that had changed the function from water irrigation for agriculture into city drainage. The function alteration has mutated physical drainage dimension that previously narrowed to the downstream become wider than the upstream. The eastern and centre city drainages flow and pumped into Wonokromo River during rainy season. The changing of the drainage and river function should change the Wonokromo design capacity to control the flood. Therefore, the Wonokromo River section should be widening by demolishing settlements above the riverbanks.

There are three alternatives to improve Wonokromo River cavity section by widening river according to flood cycle 100 years (Q100), Q50 or Q25. The ideal planning to improve Wonokromo River capacity is by using Q100, but should demolish and resettle more than 10.000 houses and households. The minimum impact to demolish less houses is by using Q25 with widening river ranged 2 to 11 meter to both side. Meaning that by using Q25 will demolish and resettle less than 3000 houses and households.

At least three aspects are determining wide differentiation of river based on river segment, are: number of primary, and secondary city drainage flow to the river, the depth of river ground level, and the most important is environmental aspect to protect quality of water resource. These aspects result to planning the riverbank in different wide of every segment. Based on existing condition of river the length of each segmental design is determined at least 200 metre. The situation of Wonokromo River and its settlements can be seen in Figure-1 and Figure-2 below.

Figure-1. Wonokromo River at Gunungsari Sub-district

Figure-2. Wonokromo River at Baratajaya Sub-district

V. COMMUNITY PLANNING PROPOSAL FOR SETTLEMENTS ARRANGEMENT

Some groups of community in Baratajaya embankment are live since more than 30 years ago. Houses are being built permanent and have two stories. They propose not to move or renovate their houses. Some small industrial houses lies along Jagir Wonokromo embankment that has been existed since 1980s claimed the land to be their property. They built houses and workshops permanently. They don't want to change houses face to river. Both community groups are in two continuous segments of river. These communities have initiation to maintaining river condition by implementing principle of "guarding the river" (*jogo kali*). The proposal planning shows that houses are still facing oppose the river. The only significant changing in houses design is opening window facing the river, but not guarantee to guarding river from household sewer disposal. They also do not agree to provide Inspection Street for river maintenance purposes.

VI. CONTRADICTION AND NEGOTIATION BETWEEN TECHNICAL ASPECTS AND COMMUNITY NEEDS

Community at this riverbank has learned from Bangkok riverbank community that similar settlements can be arranged without eviction. Bargaining the technical aspect, community agree that river should not be widening, but should be deepening. Houses allow to cut less than 6 metre to create inspection street. Community refuse to move because will loose social cohesiveness and access to economic activities.

In technical consideration, river longitudinal plane cannot follow existing line of houses row that may risk to flood, damage the river retaining wall and demolishing houses. Maintaining and deepening ground of river need to develop inspection street with minimum wide 6 metre. Therefore the minimum design requirement of river with Q25 is widening riverbank backward up to 12 metre.

Community argue that technical and technological aspects can solve problems without eviction.

VII. REVISING LOCAL DECREE BASED ON NEGOTIATION

Negotiation between technical institution and community conclude that widening riverbank should be vary depend on settlements situation, ranged from 2 metre to 11 metre. This agreement will be taken to be draft of province decree about riverbank boundary to the built-up area in inner city of Surabaya and other congested settlement area within Surabaya City. Unfortunately until now the decree draft is not legalized yet. Therefore no action to be taken by community to arrange their settlements since 2003.

VIII. PLANNING OF RESETTLEMENTS BASED ON SEGMENTAL DEVELOPMENT APPROACH

The most crucial problem of the settlements are riverbank segment of settlements at Baratajaya Sub-districts. The length segment of this settlement is about 2 x 250 metre. This settlement is dominated by permanent houses with one to two stories houses. Community lives more than 20 years and houses expanded incrementally and categorized in high density population. Community refuse to resettle in outer side of riverbanks, but agree to improve backside façade of their houses face to the river, or change the rear room with terrace face to the river. Community should provide communal sanitation system by using the ground of alley space, and reuse waste water as resource for flushing and watering plantations. Horizontal housing development activities extensively should be stopped, and population should be zero growth. It is not realistic effort if this area will be renew by build flat houses, because community refuse to live in these type of houses and there are no space of land available.

Settlements at northern side of Gunungsari segment are less densely houses population and has land space available for resettle community in walk-up flat houses. The length of this segment is about 200 metre. Planning of resettlement can be conduct by local government and community in this segment. Available land for walk-up flat should be acquired by local government, and community participate to plan type of walk-up flat houses including obtaining space for home-based economic activities and other basic services. Inspection street for maintaining river can be planned to make boundary of physical houses expansion. Indeed, these planning activities is initiated after technical river plane requirement is attained.

Another different segmental planning can be developed at the southern Gunungsari segment settlement with about 350 metre length. This area can be developed by merge hundreds of informal houses into walk-up flat. Row houses along riverbank can be moved backward to be frontage of the river, after technical river plane requirement and inspection street are attained.

IX. CONCLUSIONS

Development design for congested settlements in the riverbanks boundaries should based on considerations of: (i) minimum requirement for river maintenance space, (ii) space for minimum basic infrastructure (utility and sanitations) needs for temporary settlements to prevent river from domestic waste pollutions, (iii) space for social interaction and community activity, (iv) mitigation and escape route from flood disaster, and design of settlements should based on local segmental condition with vary range from permanent housing and dense to semi permanent and slums, from no distance to minimum distance to riverbanks boundary.

Local regulation of riverbanks boundary should refer to local condition, and case by case and can not be generalized. Local regulation should accommodate and open the opportunity for local community with legal status to participate to improve better settlements condition. Local regulation should also arrange the Millennium Development Goals to prevent environment from degradation condition. Sanction, incentive and disincentive should be implemented to encourage community participation to maintain settlements along river banks.

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