PROCEEDINGS

THE 6TH INTERNATIONAL SYMPOSIUM ON
CITY PLANNING AND ENVIRONMENTAL MANAGEMENT IN ASIAN COUNTRIES

ORGANIZERS
Asian Urban Research Group

CO-ORGANIZERS
Department of Urban Engineering, Gyeongsang National University, Korea
Faculty of Engineering, Tohohashi University of Technology, Japan
Graduate School of Human-Environment Studies, Kyushu University, Japan
Faculty of Engineering, Hasanuddin University, Indonesia
Faculty of Social Science, Mokpo National University, Korea
Center for Landscape Research, Kyushu Sangyo University, Japan

SPONSOR
Kyushu Branch of City Planning Institute of Japan

JINJU, KOREA
JANUARY 12 - 14, 2008
ORGANIZING COMMITTEE

Asian Urban Research Group

INTERNATIONAL PROGRAM COMMITTEE

Chairman

Satoshi Hagishima (Professor Emeritus, Kyushu University, Japan)

Members

Akira Ohgai (Professor, Toyohashi University of Technology, Japan)
Ananto Yudono (Professor, Hasanuddin University, Indonesia)
Atsushi Deguchi (Professor, Kyushu University, Japan)
June-Young Kim (Professor, Seokyeong University, Korea)
Junzo Munemoto (Professor, Kyoto University, Japan)
Seiji Sato (Vice President, Oita University, Japan)
Shigeyuki Kurose (Professor, Fukuoka University, Japan)
Tae-Heon Moon (Professor, Gyeongsang National University, Korea)
Tai-Chee Wong (Professor, Nanyang Technological University, Singapore)
## CONTENTS

### SESSION 1: ENVIRONMENT AND URBAN DISASTER

1. Ombeni SWAI, Atsushi DEGUCHI:  
   Analysis of Urban Environmental Issues in Developing Cities through Implementation of “Sustainable Cities Programme”  
   1

2. Dachang YUAN, Shichen ZHAO, Yue LI:  
   Study on Urban Natural Disaster Prevention System of Tianjin Binhai New Area  
   13

3. Ok-Sun KIM, Jong-Oh KIM, Cheal-Ho HA:  
   Total Maximum Daily Loads and Urban Development in the Nam-River Downstream Basin, Korea  
   23

4. Shoushuai DU, Seiji SATO, Yuji KOBAYASHI, Yuka HIMENO, Heungman KIM:  
   Change of Land Coverage and Urbanization Process of City in the Middle of Yellow River Valley - Case Study in Zhengzhou, China-  
   35

5. Peng TANG, Junzo MUNEMOTO  
   An Evaluation of CO₂ Emission Reduction based on the Supply of Condominiums in Central Kyoto  
   43

6. Ananto YUDONO, Muh Rijal SYUKRI, Faisal RAHMAN, Sri SUHADIYAH, Elis TAMBARU:  
   Community Participation regarding Tallo Riverside Development plan, Makassar, Indonesia  
   55

### SESSION 2: URBAN LANDSCAPE

7. Saadeldin ELBELTAJI, Satoshi HAGISHIMA:  
   Influence of Individual Background on Streetscape Evaluation  
   63

8. Shinichiro NAKAHARA, Atsushi DEGUCHI:  
   Impact of Land Use Control of Agricultural Land to Rural Road Landscape  
   73

9. Hyungki KIM, Atsushi DEGUCHI:  
   Planning Issues for Urban Redevelopment in Cheonggyecheon Area in Seoul - Focusing of Planning of Building Control and Floor Area Ratio-  
   83

10. Yukiko YAMAMOTO, Shinji IKARUGA, Takeshi KOBAYASHI:  
    The Open-Air Sculpture Installation to Improve Cityscape  
    93

11. Motoya KOGA, Shinji IKARUGA, Katsumi TADAMURA, Takeshi KOBAYASHI:  
    Study on Participatory Landscape Planning Supporting Method using Information Technology  
    103
COMMUNITY PARTICIPATION REGARDING TALLO RIVERSIDE DEVELOPMENT PLAN, MAKASSAR, INDONESIA

Ananto YUDONO1, Muh Rijal SYUKRI2, Faisal RAHMAN2, Sri SUHADIYAH3, Elis TAMBARU3

1Dept. of Architecture, Fac of Engineering, Hasanuddin University,
2Alumny of Post Graduate Program, Hasanuddin University,
3Dept. of Biology, Fac of Mathematic and Science, Hasanuddin University

ABSTRACT. This study aims to explore people participation and the appropriate trees landscaping on Tallo Riverside development plan, which the objectives are the improvement of the riverside environmental quality, and people response concerning the river transportation development. Based on the people participation level analysis through Pearson Correlation Technique, the results show that some physical and social factors have a positive influence to people participation level on the environment quality improvement which are consisted of housing density, disease, and education levels; on the other side, some human basic needs such as physiological, esteem, and self actualization also have a positive influence to the local people participation level. Most riverside people agree with Tallo river transportation plan. Even the percentage of people who agree with Tallo river transportation development is high, 68.53% but only 14.17% of the people live at riverside daily trips are conducted by boat instead of road transportation modes. This trend will reduce road traffic jam. Base on field survey, the dominant strong sturdy trees in the salt water at the estuary area are Rhizophoraceae and Verbenaceae families. The dominant trees in the saline wetland along 2-10 km from Tallo river estuary is Nypa fruticans Wurmb. Even Nypa trees cover some Tallo riverside areas but the tree has fragile roots, and therefore it is need to be protected by a special construction from the forceful water tide regarding river transportation development plan.

1. INTRODUCTION

1.1 Background

Makassar city is a capitol of South Sulawesi province, which based on its geographically position and the most completeness of infrastructures and social economic facilities, the city takes a role of primary city in eastern area of Indonesia. In order to plan and manage the urban area of Makassar and the surrounding regencies, those urban areas were integrated planned as a metropolitan of Makassar city, Maros regency, Sungguminasa as a capitol of Maros regency and Takalar regency, which is called as Mamminasata Metropolitan. Tallo riverside area was decided as a green belt zone of the metropitan, and therefore the riverside development plan must considers the greenery of river basin.

Tallo river is one of two long rivers which pass Makassar city, and the estuary is located at the North-West of the city. Makassar land is formed by alluvial and therefore most of the city land is plain. It was reminded at the previous study, that Tallo is a combination of river in the up-stream at Gowa regency and creek at Makassar city. Tallo river water shed area is approximately 368 square kilometers. The wide of this river is ± 250m at the estuary
and gradually become narrow at the upstream. The water at downstream of Tallo creek in Makassar city, along estuary until ±20km to the hinterland is determined by the dynamic of up and down sea level. Most people living at the upstream of Tallo river watershed are farmers, who are using the land such as paddy field, other plantation fields and their housing area. Environmentally, we are wondering that the use of surrounding river area, at upstream, mid-stream and down-stream, is not wisely on water shed environment sustainability. Preservation zone function is changed by agriculture function, and the agriculture function is changed to become urban built up area gradually. Catchments area, which naturally need for river hydraulic system is used and is destroyed by those land uses. Connected to that phenomena, the process of soil erosion, land slide, river sedimentation, flood and water pollution are occurring continuously. On the other side, as one of metropolitans, Makassar city suffers from traffic jam which growths more worst gradually. Considering many rivers at the other plain cities, such as the Netherlands cities, Paris, Belgium, Bangkok, and cities at Kalimantan island. The ancient city planning of Indonesia coastal cities including Batavia and Makassar were also had river or channel transportation mode, and had a river side city design.

1.2 Research Problems

Considering the background above, research problem is focused on how can we elevate the community participation level on Tallo river development.

1.3 Objectives

This research aims to: (1) find the way for increase the community participation level regarding Tallo river development; (2) explore the appropriate trees landscaping on Tallo Riverside; and (3) find the way for attract the people use a Tallo river transportation mode.

1.4 Method

Finding the way for increase the community participation level, regarding Tallo river development, will be supported by identification of the determinant variables which has significant correlation using parametric Pearson Correlation Technique. Exploration the appropriate trees landscaping on Tallo riverside will be done by field survey and descriptive analysis. Finding the way for attract the people use a Tallo river transportation mode will be also supported by identification of the determinant variables which has significant correlation using parametric Pearson Correlation Technique. In order to predict the trip generator of Tallo river transportation mode, it will be used the socio-economic category based trip generator.

2. RESEARCH FRAMEWORK AND THEORY

2.1 Research Framework

This study is a part of whole Tallo river research, which the previous study regarding Tallo river sustainable development has been completed at the year of 2005. Another part of Tallo river research regarding Tallo river urban renewal, especially on settlement and its infrastructure, will be done in the near future. The whole research are composed as Figure 1 below.

2.2 Theory

a. River hydraulic principle.

Integrated river basin management needs a concept of one river one plan and one management. Therefore in order
to improve the quality of Tallo river basin environment, and to use the river and its surrounding area optimally, the integrated and synergetic plan and management of government agencies, non government organizations and other stakeholders regarding Tallo river basin conservation among Makassar city, Gowa regencies and South Sulawesi province, is urgent. The dynamic of flood phenomena and its risk has forced engineers to think smartly and very carefully concerning river water hydraulic principle. Generally, there are four strategies for using river and the surrounding area, especially for control the flood:

1. Strategy 1 is to control flood totally, we must built a polder which protected by ring dike construction. It will take a huge of money, and we must consider that protection of the flood area from flood means decrease of water catchment’s area and water absorption area, and therefore the other areas will get a more volume of water current.

2. Strategy 2 takes a priority of decreasing the water current volume in the peak water debit time by stop the water in the discharge or catchment’s areas at up-stream. The water is possible used as a reservoir.

3. Strategy 3 takes a priority of natural river hydraulic function by developing a green river zone at up-stream, which lets the flood occurs at this area freely, when flood threatens the urban area or farming area at the down-stream. The green area means a riverside area includes all natural elements such as forest, swamp, open green area which capable to stop the river water during a planned time.

4. Strategy 4 is totally lets the river hydraulic function does naturally, and therefore land use, buildings, infrastructures, human activities, flora and fauna habitat must take a flood friendly life principle.

b. Community participation

The community participation level on the local development is supposed to be correlated with their basic needs fulfillment. As the previous research this study also adopts the Abraham Maslow’s basic human needs concept, physiological needs, safety and security needs, love needs, esteem needs, and self actualization needs. In order to measure the people participation, as previous research, this study also adopts the concept of Sherry R. Arnstein’s Ladder Participation.

c. Socio-economic category based trip generator

Usually, trip generator has a correlation with family members, household own vehicles, income, but Hobbs has identified that there are more other variables influence the trip generator. This study analyzed the following variables: (1) family members; (2) number of potential trip makers (workers, high and university students); (3) income/capita; (4) household own vehicles; and (5) opinion on the Tallo river transportation development.

Each variable (1), (2), (3) and (4). has three weights: high = 3, medium = 2 and low = 1. In order to predict Tallo river transportation trips, this study found 81 categories which are composed by the weight of variables (1), (2), (3) and (4). Variable (5) is opinions of respondent with score: +2 = very agree; +2 = agree; -1 not agree; -2 very not agree. The trip number of respondent who are not agree or very not agree, concerning Tallo river transportation development, is not be counted as potential trip of river transportation.

Figure 1. Research framework
2.3 Survey Method

Interview and questioner sheet were used on field survey at six residential locations, see Figure 2. Location A and B are the survey locations of community participation on Tallo river development. Location C, D, E and F are the survey locations of community participation on Tallo river transportation development. In the interview surveyors explain the Tallo river development plan, especially the idea of river transportation development.

3. RESULT AND DISCUSSION

3.1 Community Participation on Tallo Riverside Development

In order to answer the 1st research objective, the study of the way for increase the community participation level regarding Tallo river development is focused at the crowded slum housing at location A and B, which some time suffer from flood, local infrastructure and environment quality are worst. The housing areas are located at riverside of Tallo river. Based on S81 population of 5 neighborhoods this study took 60 samples. Social economic condition can be imagined by understanding of education level, income, occupation, and live length at the location. Fifty five percent of householders education level are elementary school, 20% junior high school, 20% senior high school, and just 5% graduate from higher education. Based on South Sulawesi province income standard, Rp 510,000, 50% householders income are under the standard, 48.33% a little bit above the standard, 1.67% high (2–3 x standard) and no one has a very high income (10 x standard). Most of community are migrant (76.67%) come from the hinterland regencies of South Sulawesi provinces. They come to Makassar for working because this city provides more kinds of working fields than their origin regencies. The live length of people is described at Table 1.

Table 1 proves that Makassar is a primary city in South Sulawesi province, who migrants are coming from other origins include other provinces. Unfortunately, most of migrants are people who has not enough education, skill and financial capitol, and therefore most of them live at the slum housing. Their social economic condition and the limited ability of Makassar municipal for service them causes the slum housing is growing in this city. This study found some variables which correlated with the level of people participation on the effort of Tallo river development.

Table 2 shows that people participation level has a significant positive correlation with building density which is represented by house to house distance and floor area ratio. The participation level is also has a very positive significant correlation with disease which occurs frequently and with education level. Those means that to increase people participation level we should do a project which will impact the health of houses and make they safe from housing mass fire. On the other hand people will eager participate on the effort to eliminate disease and to elevated their student education.

Several existing independent variables

<table>
<thead>
<tr>
<th>Live length (%)</th>
<th>Origin</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years</td>
<td>Outside of Makassar</td>
<td>33.33</td>
</tr>
<tr>
<td>6-10 years</td>
<td>Outside of Makassar</td>
<td>38.33</td>
</tr>
<tr>
<td>11-20 years</td>
<td>Makassar and outside of Makassar</td>
<td>15.00</td>
</tr>
<tr>
<td>&gt; 20 years</td>
<td>Makassar</td>
<td>13.33</td>
</tr>
</tbody>
</table>
such as physiological needs, esteem needs, self actualization needs, community leader role, and information access easiness have a significant correlation with the level of existing participation, see Table 3. The existing of people participation level on Tallo river development is very low. That means that people almost do not have a spirit and they don’t care for improvement their living environment quality condition. Based on human basic needs principle (6), they are in the worst condition, that their energy is focused to fulfillment the bottom human basic needs or physiological needs such as fresh water, food, cloth, shelter and income. This physiological needs has a very significant correlation with:

a) esteem needs, that means they need their aspiration for improvement the easiness for fulfillment their bottom human needs is accepted and is realized by government;

b) self actualization, that means the government lets them an opportunity for working, even on informal sector; or government or other potential stakeholders give them a capacity building training for getting an appropriate work field which give them a sufficient income;

c) information access, that means they need easiness access to information concerning the fulfillment of their basic needs.

d) Safety needs, that means they are safe from disaster, especially suffer from flood, mass fire, and disease.

The future participation level is also analyzed, which the result is described at Table 4.

The future or people hope participation level is also low, even it is a little bit high then the existing their participation level. In the number range between 0 to 8, the existing level is 0.65 and the hope level is 2.85. Level 0 means respondent totally doesn’t need do anything, and level 8 means respondent as member of local community group will together take a role and responsibility, without any action of government, include idea, plan, financial, organization, realization of plan and controlling. Level 2.85 means respondent just take a role as an object who hopes the government take a responsibility and a risk on the Tallo riverside development project. In order to increase the community participation level the development project must

<table>
<thead>
<tr>
<th>Table 2. Correlation between people participation level with social economic variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation level</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>House own status</td>
</tr>
<tr>
<td>Land own status</td>
</tr>
<tr>
<td>Education level</td>
</tr>
<tr>
<td>Income</td>
</tr>
</tbody>
</table>

Note: Pearson Correlation
* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

<table>
<thead>
<tr>
<th>Table 3. Correlation between existing participation level and existing basic needs fulfillment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation level</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Physiological needs</td>
</tr>
<tr>
<td>Emotional needs</td>
</tr>
<tr>
<td>Self actualization</td>
</tr>
<tr>
<td>Social needs</td>
</tr>
<tr>
<td>Community leader</td>
</tr>
</tbody>
</table>

Note: Data was analyzed by non-parametric Pearson Correlation Technique
* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

<table>
<thead>
<tr>
<th>Table 4. Correlation between hope participation level and basic needs fulfillment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope participation level</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Physiological needs</td>
</tr>
<tr>
<td>Safety needs</td>
</tr>
<tr>
<td>Emotional needs</td>
</tr>
<tr>
<td>Social needs</td>
</tr>
<tr>
<td>Community leader</td>
</tr>
</tbody>
</table>

Note: Data was analyzed by non-parametric Pearson Correlation
* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

59
has an impact on:

a) physiological needs, that means the development project provides fresh water, shelter improvement and field work for making a better income;
b) esteem needs, that means they need government and other people respect to their right for live in the place when other people can live;
c) self actualization, that means the government let them an opportunity for work and build their future better life;
d) information access, that means they need easiness access to information concerning the fulfillment of their basic needs.
e) Safety needs, that means they need a security of tenure for live, work, health, and study for their children.

3.2 Tallo River Landscaping

Tallo creek riverside is located at alluvial plain of Makassar city, and therefore sea water intrusion impacts soil surface water, sea Figure 3. From estuary until approximately 5 km from estuary the soil surface water is high influenced by sea water intrusion. Approximately 5–10 km from estuary to hinterland, the soil surface water is still low influences by sea water intrusion. Part of Tallo water shed area, especially along the low land of riverside until 10 km from estuary suffer from flood, especially during rainy season, October ~ April.

In order to improve the beauty and attractiveness of Tallo riverside panorama, appropriate riverside land use plan and landscape design is urgent. Tallo river transportation mode development will make a forceful water tide, which will destroy the fragile root trees along side of the river. Trees plantation has to consider the character of trees. Base on field survey, the dominant strong sturdy trees in the salt water at the estuary area are Rhizophoraceae and Verbenaceae families. The dominant trees in the saline wetland along 2–10 km from Tallo river estuary is Nypa fruticans Wurmb. These kind of trees give a special landmark, and therefore those must be conserved, especially at zone IIB, IIA and IIIA, find the list of appropriate trees at the appendix pages. Because Nypa fruticans Wurmb is a fragile root trees, a special construction which lets the inter-connection of natural river habitat and natural land habitat is need. The appropriate trees for other land zones, IIA, IIA and IIIA are same with trees which growth at other Makassar city area, such as teak, mango, coconut, bamboo etc. On the other side, in order to protect the riverside line from erosion process which will be influenced by strong water tide, a special construction is need.
3.3 Community Participation on Tallo River Transportation Development

In order to answer the 2nd research objective, the study of the way for attract the people use a Tallo river transportation development (TRTD) is focused at the riverside housing area at location C, D, E and F, which the residences are supposed to use the river transportation mode. Using non parametric Pearson analysis, this study found several variables which have a significant correlation with people opinion concerning Tallo river transportation development idea, see Table 5.

Table 6 describes that number of family members/house; income/capita; number of provided vehicles/houses have a significant correlation with the number of person trip/house positively.

The person opinion of people concerning TRTD are very agree 9.09%, agree 59.44%, not so agree 25.17%, and totally not agree 6.29%.

That means 68.53% residents agree with TRTD. Table 5 describes that income/capita and number of provided vehicles/houses have a negative correlation with the residence response for using Tallo river transportation mode (TRTM).

a) The income/capita has a negative correlation with the using possibility of TRTM, it means that the rich people, who able to by a private vehicle such as car or motor-bike, are tend not use a TRTM;

b) The number of provided vehicles/house also has a negative impact correlation with TRTD, that means the bigger number of provided vehicles/house impacts the possibility of using Tallo river transportation mode (TRTM) lower.

Based on the weight of socio-economic category and the score of TRTD opinion, the number of daily trips of residents who live at riverside area and very agree with TRTD is counted 100%, the trips of residents who agree with TRTD is counted 50%, the trips of residents who not so agree with TRTD is counted 25%, and the trips of residents who totally not agree with TRTD is not be counted. Even more then 65% residents agree with TRTD, but the possibility resident trips using the TRTM is only 14.17%. The attractiveness of TRTM which must be compared with usual road transportation modes, such as land public transport services and the convenient of private vehicles, will change the percentage of person trip using the TRTM. On the other side TRTM is potential used by tourists if the attractiveness and the amenity of Tallo riverside city be developed very well, and the Tallo river and its branches has a good navigable connected to Makassar coastal and small islands surrounding the city.

4. CONCLUSION

1) Most of residents living at Tallo riverside area are shortage on the fulfillment of human basic needs, and therefore to elevate their participation level concerning Tallo river development program, the program must impacts to fulfill their human basic needs, such as: (a) security of tenure concerning their living status; (b) capacity building and field works which give them appropriate income; (c) easy access to information concerning the human basic needs fulfillment; (d) safe from flood, mass housing fire and disease; (e) cheap health services; (f) cheap education for their children.
2) The beauty and attractiveness of Tallo riverside landscape needs reforestation of local appropriate trees, which the appropriate main trees for the surrounding estuary zone are Rhizophoraceae and Verbenaceae families. The appropriate main trees for the zones are located more far from the estuary, which the sea water intrusion is low, is Nypa fruticans Wurmb family.

3) Even the percentage of people who agree with Tallo river transportation development is high, 68.53% but the possibility person trips using Tallo river transportation mode (TRTM) is low, 14.17%. In order to increase the attractiveness of TRTM, the competitiveness of TRTM, especially concerning route, tariff, safety and trip time must be accepted by trip makers. On the other hand, TRTM is potential used for integrated Makassar river and marine tourism development.

REFERENCES


Appendix 1. Table of appropriate trees for Tallo riverside landscaping

<table>
<thead>
<tr>
<th>Zone</th>
<th>Character</th>
<th>No</th>
<th>Latin name</th>
<th>Family</th>
<th>High (m)</th>
<th>Crown diameter (m)</th>
<th>Root strength</th>
<th>Local (L) botanical (E) English (E) name</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>High sea</td>
<td>1</td>
<td>Rhizophora</td>
<td>15-20m</td>
<td>5-8m</td>
<td>Strong</td>
<td>Mangrove (E)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td>marinae</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>intrusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>zone, and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>suffer from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>periodical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>flood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Low sea</td>
<td>1</td>
<td>Rhizophora</td>
<td>15-20m</td>
<td>5-8m</td>
<td>Strong</td>
<td>Mangrove (E)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td>marinae</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>intrusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>zone, which</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sometime</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>suffer from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>periodical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>flood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>No sea</td>
<td>1</td>
<td>Nypa</td>
<td>4-6m</td>
<td>3-5m</td>
<td>Weak</td>
<td>Thanh palm (E)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>water</td>
<td></td>
<td>fruticans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>intrusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>zone, and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>easily</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>suffer from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>periodical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>flood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field survey, May 2007