7th proceedings

water friendly architecture

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PREFACE

The Department of Architecture Faculty of Engineering Hasanuddin University is pleased to present this publication, the Proceedings of 7th International Seminar on Sustainable Environment and Architecture (SENVAR7) with the central theme “Water-friendly Architecture”, Makassar, 20-21 November 2006.

The primary aim of SENVAR7 is to explore water as an indispensable substance for living. As a natural resource, a part of physical environment, its existence offers nearly unlimited utilisation for human settlement and its infrastructures including transportation means, energy resources, and landscape features. On one hand, water provides abundant benefits, on the other, it may bring about severe disasters such as floods, abrasions, and tsunamis that certain countries and regions have experienced quite frequently in the last decade. This has compelled us all to cope with the risk of the friendly water which may turn out to be a destructive force to our settlements.

In this respect, SENVAR7 as a continuation of previous events is held as a scientific forum for architects, urban planners, environmental scientists, and environmental engineers, to share and discuss ideas and experiences.

We invite interested colleagues who challenge to exchange crucial views on various issues related to the central theme. We encourage a critical discourse through the presentation of research findings, as well as practice- and teaching-related experiences in papers and posters which are categorised into 5 topics i.e. Coping with Water Disaster, Sustainable Planning & Design, Water & Human Settlement, Water for Leisure and Daily Use, and Engineering-related Environmental Problems. We are delighted that this Seminar receives enthusiastic responses not only from our Indonesian colleagues but also from colleagues of our neighbouring countries such as Malaysia and Hong Kong, with a total of 62 presenters comprising 58 papers and 4 posters.

We would like to express our gratitude and appreciation to all keynotes speakers, presenters, participants, members of steering and organizing committees, sponsors, as well as all of our colleagues for the invaluable contributions in this Seminar.

We wish all participants will find this Seminar intellectually beneficial as well as fascinating, and looking forward to meeting you all again in future seminars.

Makassar, 20 November 2006
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Prof. Dr. S. Trisutomo
Chairman
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The regeneration of coastal cities is one of the key architectural, urban design and planning innovation with the of industrial decline, enhance liveability and sustainability and transform the image of the Indonesian archipelagic and marine decline. Thus, the various design and planning model for waterfront regeneration could be able to develop and expand into mixed-use and hybrid function which invent new conjunction of public and private interest. In this emerging waterfront projects, inter-coastal cities competition turns the city into a product which is marketed and sold, focusing attention on the imagery which iconic the city and differentiates it from other coastal cities. Such images include iconography of local waterfront and function is linked to the rise brand marketing in the archipelagic context. These planning activities show there have been wide array of responses the opportunities and problems associated with spatial networks of coastal areas of metropolitan cities. They recognize a process starting with growing the nodes (coastal activities centers) and clustering some sub spatial networks through bridging them by water transportation systems. This process is shaped by creating multi-layered network of regional coastal cities into some clusters and corridors in the context of waterfront metropolitan regeneration in archipelagic country. There are three level of network in archipelagic spatial planning concepts that is cities network, regional network (intra-island and inter-island) and global network for fostering the ability of other regions to rival Jakarta city dominance in activities and drawing power. This is only when the regional coastal cities have acquired this power can there be a harmonization of centralized and decentralized planning policy.

Keywords: archipelagic, regenerating, network

Introduction

The regeneration of urban waterfront areas are the strategic issues of development planning and design policy in Indonesian archipelagic country. The role of waterfront is not just to serve as working ports or industrial sewers, waterfront areas in coastal cities have to become to be a new role of places of urban transformation with the potential to attract investment and reverse pattern of old harbor functions in one side and to conserve the coastal zone environment sustainability in other side.

Watershed-Based Coastal Zone Management

In the archipelagic context, water gets recognized as a main environmental features as far as management of water resources potency and water disaster system. In cosmological model the water symbolism was a total experience of oceans and mountains and a total of environment on macrocosmic scale. Most of Javanese, Madura, Bali and Lombok royal city has an "upper stream and down stream" characters for symbolizing the total living world. The Indonesian archipelagic country constitutes mountain and oceans in the making. Thus, the 'land-based and water-based linkage' civilization plays a main role in search for symbiosis within the archipelagic fabrics system.

As land-water interaction areas (eco-tones), coastal zone is an unique area based on its eco-socio system such as : a multiple use zone which has a highly biodiversity and common
property resources and open access areas, habitats for endemic and endangered species, and spawning, nursery and feeding areas for oceanic organism and accumulated land-based waste area. There are also some functions of coastal zone for urban living culture such as environmental services for urban living support, amenity services, natural resources and wastes reservoir and absorber.

In the context of coastal zone management, the fact that the problems appeared in the coastal zone are mainly caused by the external factors such as came from land-based urban living activities which are through watershed directly or indirectly impacted coastal zone. To solve or at least to minimize these problems, a watershed-based integrated coastal zone management is importantly needed for achieving sustainable coastal zone management.

![Figure 1 - Up Stream – Down Stream Linkage](image)

Symbiotic Unification of Coastal Cities

The national policy of decentralization sought to decentralize new development of coastal cities which had become too concentrated, planning and building the waterfront areas throughout Indonesia. This policy appeared to be an ideal plan for the improvement of local context throughout Indonesia, highly advantageous to the local people of those regions, and in fact within the certain limits, the decentralization was effective.

However, the totally and complete decentralization proved to have some major disadvantages for local areas. Firstly, it was extremely wasteful in the terms of the investment required in the infrastructure of public works. Secondly, it makes it difficult for people to move between regions. The mobility that characterizes modern society could not be explained simply in the terms of the development of transportation. Thus, the fact is that in the era of information society mobility has begun to possess considerable value for its own sake. Thirdly, it is that, economically speaking, a small coastal city simply could not compete with a big one. There is no way that a small coastal city can match a large one in the amount of available capital, population or consumer activities. Simple decentralization only leads smaller cities to make fruitless efforts to achieve that which they never can. (Kurokawa, 1991)

The policy of complete decentralization has some disadvantages and is no better than the opposite policy of complete centralization in a single region. Thus, the symbiotic policy of regional coastal cities neither centralization nor decentralization but a network coastal cities is at last taking shape.

Due to their position at edge of the cities, morphology of coastal line, island dimension and position and accessibility, the coastal cities areas have up until now functioned in the main as distribution and production areas. And, because of their restricted nature of their location, private usage of these areas which are usually under public management has been controlled by various regulations.

Such considerations as proximity to the urban areas, an openess peculiar to a waterfront and the accessibility to the waterfront areas are important factors in creating new frontier
functions to cope with present conditions and problems of the coastal cities. Therefore, the networking methods to improve the unification of coastal cities as a whole in the archipelagic context is necessary.

Figure 2 - Historic Waterfront City

Figure 3 - Modern Waterfront City

The Concept of Clusters And Networks

In the national development plan, there is much emphasis on the Jakarta metropolitan zone and the Jabodetabekpunjur megalopolitan zone. To ensure that the entire megalopolitan of Jakarta can function as one of the international centers in the near future, the development of Jakarta Bay Area for which high use demand continues to increase and the adjacent coastal areas, while encouraging at the same time the selective decentralization of various functions to other business centers and the reform of regional structures. It must also offer methods to the other coastal regions of Indonesia for resisting Jakarta dominance. These coastal regions must be linked to the creation of a network of regional cities that can rival Jakarta.

Beside the creation of national wide-network of regional coastal cities, a major redevelopment of Jakarta is required to provide it with the capacities to function as it must to serve as an opening to the network of global cities. This redevelopment is not undertaken solely for Jakarta's sake, it is no more than the preparation of the access route through which one of the networks of a global on entirely different, much higher level, a network that will create a new era in every coastal regions of Indonesia, will enter.

The coastal area development has played a very major part in the regeneration of the inner part of many Indonesian land-based metropolitan cities. However, almost all of the approaches have often ignored the broader regional impact in the national wider level view. This approaches involve the creation of special authorities and the encouragement of private property development. It was also expressed in the creation of authorities to deal with waterfront redevelopment, involving enterprise zone and urban corporations. In these ways waterfront locations have become the site of some experiments with new planning arrangements and new links between government and corporations in an effort to attract private sector investment.
These planning activities show that there have been a wide array of responses the opportunities and problems associated with spatial networks of coastal areas of metropolitan cities. They recognize a process starting with growing the nodes (coastal activities centers) and clustering some sub spatial networks through bridging them by water transportation systems. This process is shaped by creating multi layered network of regional coastal cities into some clusters and corridors in the context of waterfront metropolitan regeneration in archipelagic country.

Figure 4 Clustering Concepts
Conclusion

As the conclusion, some notes can be presented here. Firstly, encouraging more development in the major regional coastal cities and undertaking new development projects outside Jakarta will establish and enrich the regional network in Indonesian archipelago country. It is needed to create watershed-based coastal regional zone that sustain the ecological system and preserve the uniqueness of each area.

Secondly, there are three levels of network in archipelagic spatial planning concepts that is coastal cities network, coastal regional network (intra-island and inter-island) and global network for fostering the ability of other regions to rival Jakarta dominance in activities and
drawing power. This is only when the regional coastal cities have acquired this power can there be a symbiotic or harmonization of centralized and decentralized planning policy.

References


Prayitno, Budi (2004), Rekayasa Ekologis Permukiman Tepi Pantai, Simposium Nasional Rekayasa Aprikasi Perancangan Industri, Universitas Muhammadiyah Surakarta

Prayitno, Budi (2004), Urban Symbiosis in the Aquatic Public Space, 1St International Seminar in Urban Design, Universitas Gadjah Mada.

Prayitno, Budi (2004), “Rekayasa Tata Ruang Negara Kepulauan, Seminar nasional; Peran Teknologi dalam Transformasi Budaya Manusia, UIY, Yogyakarta