Session Report:

ENVIRONMENT II

Chairperson: Alfred H-S. ANG (University of California, Irvine, USA)
Secretary: Yoshihisa SHIMIZU (Kyoto University, Japan)

Prof. Alfred H-S. Ang

Dr. Yoshihisa Shimizu

Flooding in Vietnam and Civil Engineering Solution
by Dr. Nguyen Truong Tien, Mr. Nguyen Cong Giang & Eng. Vu Minh Duc
Prospect of Construction Industry and Sustainable Development (Cancelled)
by Dr. Sang Eun Lee
Landfill Islands Project for Creating New Environment
by Prof. Masashi Kamon & Prof. Norihisa Yokouchi

Dr. Nguyen Truong Tien

Dr. Sang Eun Lee

Prof. Masashi Kamon

1. Summary

The session consisted of papers presented by authors representing two different countries in Asia. Each of the presenters described different aspects of environmental problems in the respective countries that are worthy of major technological consideration necessary for sustainable developments. Specifically,

Dr. Nguyen Truong Tien and his colleagues described the problem of flooding in Vietnam and proposed engineering solutions unique to the country; and

Prof. Masashi Kamon and his colleagues described the landfill islands project for creating a long-term waste disposal site in the Bay of Tokyo.

The problems expounded by the authors clearly illustrate examples of the need for proper or innovative engineering solutions for sustainable development that will benefit the population, and preserve and enhance environmental quality in the Asia region; the proposed solutions may also be applicable to other parts of the world.

Although there was no presentation, the paper by Dr. Sang Eun Lee discussed the need for environment-friendly construction for sustainable development.

2. Presentation Highlights

Tien presented the human suffering and property damage caused by flooding of rivers in the Cuulong River Delta region of Vietnam. In particular, the flooding of the Cuulong River in 2000 is the largest recorded in the past forty years. Human casualty was in the hundreds, and thousands of houses were demolished with over 800,000 houses inundated; agricultural fields and infrastructures also suffered extensive damages. Existing landfill and embankment proved to be inadequate; embankments are only 1 m to 4 m high which are easily topped by the flood level, and were constructed with little or no soil improvement. Proposed civil engineering solutions include the construction of dikes with improved soil condition using local materials, construction of houses with mini pile foundations, and protection of river banks. Finally, additional studies including pilot projects are suggested by the authors.

Kamon's presentation described a study of the new landfill islands project in the Bay of Tokyo, a project proposed by the Research Committee of the Japan Society of Civil Engineers. It is envisioned as a long-term solution to the solid waste disposal and management for the metropolitan areas of Tokyo. The proposed project is a large-scale civil engineering development involving the construction of three major islands located in the center of Tokyo Bay. The islands will cover an area of 32 km^2 with a fill capacity of almost 3 billion m^3 of solid waste and surplus soils, to accommodate the waste disposal of the city in the next 50 years. The construction will consists of an outer breakwater for the Landfill islands, and an inner revetment of light structures, and will have tidal flats and beaches to purify the water quality. Steps will be taken to insure that stable types of waste, such as waste concrete, glass, slag and surplus soils are deposited below the sea water level, whereas controlled waste will be used to fill above the sea surface to avoid harmful leachate. The environmental effects of the reclaimed waste material, particularly on the ocean

environment, as well as the construction cost, have been carefully evaluated in the study and determined to be a practically feasible and environmentally friendly long-term solution to the waste disposal of the mega city of Tokyo with a population of 40 million.

Lee pointed out that the growth in the world economies in recent decades cannot be sustained without more attention to preservation and improvement of the environment. 10% of the world GDP and 40% of the world's energy are associated with the construction and operation of constructed facilities. The construction industry, therefore, has a special responsibility in contributing to the future recovery and protection of the environment. In Korea, the economy has been growing at an average annual rate of 6-9% since 1960, and in order to meet the need for housing of its growing population, the construction industry currently accounts for 12% of the GDP and 9% of the work forces. Because of its significant contribution to the national development, the construction industry also has immense impact on the environment; deterioration of the natural environment is potentially inevitable with such rapid economic development. For example, reduction of CO_2 emissions (which Korea ranks 12^{th} in the world in emission), is important in the energy intensive consumption in any construction work. In 1999, the Ministry of Construction and Transportation started the declaration and the development of policies and strategies for implementing environment-friendly construction, including 10 major tasks related to construction activities. The construction industry has began to respond positively by employing environmental management in construction works; in this way, the construction industry has become more conscious of its role in preserving the environment, and should serve well to continue the sustainable development in Korea.

3. Conclusions

Each of the presenters described an environmental problem that is of current importance in the respective countries. In each case, the central thrust of the papers is that preservation of the environment must be an important consideration in any economic and technological development, and in all cases sensible solutions to sustainable development will require a balance between engineering and construction of infrastructures and the conscious preservation/improvement of the environment.

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