

MINUTES

Session on Subject of Common Interest
“Infrastructure development considering global
and local environment
(for sustainable development of society)”

Minutes

1. Date and venue: 13:00-16:05 Tuesday, 16th November 2010
International Conference Room of NILIM

2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Kazuhiro NISHIKAWA
	Mr. Akira TERAOKA
	Mr. Masaaki NAKAYASU
	Mr. Hirouki KISHIDA
	Mr. Junich YOSHITANI
	Mr. Hiroaki TERAMOTO

3. 19th Meeting on Public Works Research and Development in Asia Conference Report by Mr. Masaaki Nakayasu

Today's topic I will be talking about is, "The conference on Public Works Research and Development in Asia." This conference is an opportunity to share and discuss the issues and challenges faced by the Asian countries.

My introduction is divided into five parts; the background of the conference, the objectives, history, countries that have participated in the past, and the past achievements of the conference.

The former Public Works Research Institute had decided to bring together the top officials of public works institutes in Asia to a forum in order to establish a close relationship in the area of Public Works R&D. As a result of efforts to realize this, the first international conference was held in 1993 in cooperation with Japan International Cooperation Agency.

The three objectives of the conference are information exchange, discussion on common technological issues, and establishment of personnel network in R&D between participating countries.

Information exchange has been done on specific issues that Asian countries are facing today. Due to historical and geographical differences, Asian countries have big differences on development and infrastructure status. Therefore, it is useful to share the current state of infrastructure and development and management plans in each country before discussion. In order to understand these in each country, each participant is presenting a country report. Specific issues discussed in the past conferences include water pollution of the Mekong River in Thailand, Cambodia, Laos, other countries, flood disaster in Bangladesh, landslide in Nepal, urban traffic congestion in China, and volcanic disaster in the Philippines.

To establish a global sustainable society, we need collaboration in the whole Asia in common issues, considering regional and social differences. By bringing knowledge and experience together, we can discuss technically and politically the challenges and also shed light on these challenges faced by each country. Some common issues include climate change, natural disaster, water resources management, international freight transport system, and traffic and road. Issues of this conference will be global and regional environment.

The final objective of the conference, personnel network can be established through discussions. I expect this will expand to a larger scale network and a joint project between two countries.

The conference is an annual event. The themes of past conferences vary from disaster management, environment, to training of civil engineers. The conference this year is the 19th one with them of "Infrastructure Development Considering Global and Local Environments - for Sustainable Development of Society - ."

From 19 countries, 151 government engineers participated in the past conferences.

Below are examples of NILIM's achievements of the conferences: research cooperation in Asia, technical cooperation and promotion through JICA projects, and inter-visitation. More details of research cooperation in Asia are: memorandums signed with counterpart organizations of India and Indonesia; joint workshops on disaster management in Indonesia and Vietnam; and technical promotion and cooperation in Indonesia for erosion control and capability building on road management. With respect to inter-visitation, 971 NILIM

researchers visited institutes in Asia outside Japan and 1814 researchers came to NILIM. NILIM would like to increase this exchange activity further.

As a conclusion, this conference has contributed to research development in the area of public works in Asia. This conference is the most important international activity for NILIM. I am sincerely hoping that this conference will be fruitful and productive for all of you and that your stay in Japan will be an abiding memory of you. Thank you.

4. Country Reports

Presentation from Japan: Dr. Kazuhiro Nishikawa

Until quite recently, Japan had been witnessing a rapid increase in population. The population increased by a factor of 3.4 from 1875 to 1975, from about 34 million to 120 million, and with a few exceptions, the annual rate of increase was over 1% during this period. This made Japan much more populous than western countries. Now, the Japanese population is about 127 million, but it has started to decrease after peaking in 2007. It is estimated that it will be less than 100 million in 2050, because of the rapidly decreasing birthrate and life expectancy.

The Japanese economy achieved an annual growth rate of more than 10% between the 1960s and the early 1970s. During this period of high economic growth, the living standards of people in Japan were improved greatly, but this period also left negative legacies such as environmental destruction. Affected by the oil shock in 1973, the pace of economic growth slowed down. The oil shock damaged Japan severely because the country depended on oil for most of its energy. Japan promoted energy-saving measures as a national policy and made significant developments in energy-saving technologies. Today, Japan's oil dependency is less than 50%.

Economic growth slowed down further at the beginning of 1990. Although the slowdown was largely attributed to the burst of the economic bubble, some analyses suggested that it was greatly affected by the decrease in the productive population (that is, people between the ages of 16 and 65 years), which started in 1995. At the same time, another important factor was that people began to pursue a sense of spiritual wellbeing instead of material wealth, as they diversified their beliefs about happiness. An opinion survey conducted by the Cabinet Office indicated an intensification of the trend to place as much importance on the natural environment as on disaster prevention and a stable supply of food and resources, and this was a subject that the nation would have to emphasize in its nation building for the next 20 years. The same change can be observed in the tasks assigned to the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). In particular, in urban areas, citizen groups are involved in an increasing number of tasks related to environmental conservation.

Historically, environmental problems arose in three stages in Japan. In the first stage, which started around 1960, public hazards, including water pollution and atmospheric contamination, attracted public attention. Subsequently, awareness of conservation and restoration of the natural environment started to increase around 1970, and geoenvironmental issues began to come under the spotlight around the year 2000. To address these issues, the government enacted the Basic Act for Environmental Pollution Control in 1967, which was superseded by the Environmental Basic Act in 1993, the Nature Conservation Act in 1972, and the Law Concerning the Promotion of Measures to Cope with Global Warming in 1998.

Public hazard is one of the negative legacies of the period of high economic growth. It is defined as "pollution caused by business and human activities that spreads considerably widely and damages human health and the living environment." It is easy to imagine that the rapid improvement of expressways and the sharp increase in the number of cars, beginning in the 1960s, were partly responsible for the atmospheric contamination. The environmental

standards of emission control grew stricter because cars were regarded as one of the emission sources of nitrogen dioxide, which is harmful for human respiratory organs. These standards are helpful in decreasing the observed amounts of nitrogen dioxide, and the level of atmospheric contamination has been greatly improved.

Recently, strong measures for the reduction of gas emissions through mitigation of traffic jams have been introduced to help in the reduction of nitrogen dioxide. Smoothly running traffic, achieved through the introduction of state-of-the-art technologies such as vehicle information communications systems (VICSS) and electronic toll collection (ETC), contributes to environmental improvement. The VICSS supplies the driver with traffic information in real time and helps him select roads to avoid traffic jams, which results in lower gas emissions and better energy saving. The ETC also contributes to the improvement of the surrounding environment and energy saving by reducing traffic jams considerably, which is achieved by eliminating the necessity for a driver to stop at a toll booth on a toll road. This is one of the systems for which the National Institute for Land and Infrastructure Management (NILIM) itself performed experiments and implemented the system through joint research with public companies.

As for water quality, environmental standards were established on the basis of the Basic Act for Environmental Pollution Control, and various measures were taken to achieve them. The major measures included regulations on effluent from plants, and improvement of the sewage system. At present, 90% of rivers have cleared these environmental standards. Because the sewage system across the country now covers 70% of the population, rivers in particular have recovered their water quality greatly, which has allowed animals and plants to return to these habitats. There have been some reports stating that rivers that once had detergent foam on and above the surface have become clean, and animals and plants that used to live there have reappeared.

Mitigation and adaptation should be considered simultaneously to address global warming. Various plans are being formulated with an emphasis on adaptation for rivers. NILIM has estimated the situation of heavy rain in 100 years' time in collaboration with researchers in various meteorological fields; they found that heavy rain would be 20–25% stronger, especially in the northern part of Japan. At the same time, the research team also estimated that the volume of water flowing into dam lakes would decrease, because the increasing temperature would melt snow earlier in 100 years' time than it does at present, and so the amount of water flowing into dam lakes would decrease. Therefore, it may be possible that more severe water shortages will occur in the irrigation period (needed for rice cultivation) than in other periods. The research results that NILIM have published are used in the reports for the committee of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) as their base data. On the basis of the policy reports, adaptation policies for each river will be formulated.

MLIT formulates successive environmental policies and action plans, which organize the knowledge gained from successful cases and from lessons learnt, in a bottom-up manner. In the latest environmental action plan, it voiced the following four viewpoints as the important approaches to achieve each target in terms of public hazards, conservation of natural environment, and geoenvironmental issues.

The most important task is to improve the environment and economic society in an integrated manner. A good environment can supposedly be constructed inexpensively in the long run if more consideration is given to the environment from the planning stage in the development of social capital. The second point is to acknowledge the importance of integration and collaboration. Various departments need to work together to address environmental issues. It is necessary to put technologies developed by universities and public companies into practical

use, and to make decisions while maintaining communication with residents. The third is to motivate people and companies to take action. Collaboration with companies and residents is necessary, and it is sometimes necessary to entrust residents with management. The fourth is to place importance on the expansion of viewpoints in terms of both area and time. It is necessary to make evaluations by extending the time up to the life cycle of the facilities, to address problem-solving by thinking about the basin instead of focusing only on the river, and to take approaches that transcend the regulations imposed by existing laws and established practices.

In the period of high economic growth, Japan had to rush the construction of expressways in urban areas to be in time for the Tokyo Olympics in 1969, and many expressways were constructed on the rivers used as canals. The stone bridge called Nihonbashi at the center of Tokyo was no exception. Back then, the scene of cars traveling on the structures above was said to be a symbol of high economic growth. However, no one now says this is a beautiful sight. It is said that it would cost five billion dollars to dismantle these elevated bridges. I think Japan could have achieved better results if it had considered the four viewpoints I mentioned above for its development in that period of high economic growth. It gives me great pleasure that the specific issues and case examples observed in the on-site review will be analyzed from those four viewpoints hereafter for the building of a better nation.

Presentation from India: Mr. Koneru Venkata Ramana

Mr. Koneru Venkata Ramana presented the inception report on Directorate of Ports, Government of Andhra Pradesh (AP), India. The organization position in the government and also the organizational hierarchy of the port department was explained in brief.

Coastline of India including Andaman and Nicobar Islands and Lakshadweep Islands is 7517 kilometers and Indian mainland is 6100 kilometers. The coastline of India is surrounded by Arabian sea in the West, Bay of Bengal in the east, and Indian ocean in the South. To protect this coastline, Indian Coast Guard was constituted in February 1977. State wise, the coastline of Andhra Pradesh is 996 kilometers, only next to Gujarat with 1600 kilometers and then Tamil Nadu with 910 kilometers.

Along the coastline in India, there are 12 major and 139 non-major ports. Major ports are controlled directly by the Government of India. Non-major ports are controlled by state governments. Andhra Pradesh has one major port and 15 non-major ports with 5 non-major ports in operation, 6 under development, and 4 which will be developed in the future. The cargo handled by these five non-major ports in operation is 43.29 million tons earning 75.73 crores in revenue to the Government of AP.

The broad principle that is followed in the development of non-major ports is public-private partnership with state support. Private developers entered into long-term agreements of 30 years under BOOT basis. The state supported the project by providing long lease of lands, fiscal incentives, providing external infrastructure to the port, and bearing the cost of relief and rehabilitation (R&R) of the project.

In Kakinada Deep Water Port (KDWP), Government of AP constructed three berths at a total cost of 293 crores by 1996 with ADB loan. In 1999, the Government gave the project to a developer, M/s International Seaports Ltd (renamed as Kakinada Seaports Limited) for effective implementation of the project. The project was awarded on operate, maintain, share, and transport basis. The initial period was for 20 years, which was later extended to another 20 years. The developer invested 400 crores into the project and has proposed to expand the cargo handling capacity by constructing two more berths. The developer has to share 22% of

gross income as revenue to the Government of AP. The cargo handled at KDWP is basically ammonia, bitumen, coal, POL products, etcetera.

The Gangavaram Port has three equity partners, M/s DVS Raju, Warberg Pincus, and Government of AP with 58.1% share owned by M/s DVS Raju. Around 178 crores of expenditure was incurred by Government of AP to develop the port infrastructure including land, road connectivity, water supply, R&R.

Next, the Krishnapatnam Port Concession Agreement was entered in 2004 for 30 years on build, operate, share, and transfer basis (BOST). Five multipurpose berths were built with three more berths under final construction. A special purpose vehicle was formed to provide rail connectivity to the port planned in two phase with Phase I of 19 kilometers completed and Phase II of 91 kilometers still in progress. The port also has road and airport connectivity which is proposed to be further upgraded in the near future; the four-lane road will be upgraded to six-lane road in the future. In Phase II, seven more berths are proposed to be constructed.

In India, there are number of issues and challenges faced by the Port department as well as by the developers at present. Firstly, the logistics of port development is governed by multiple ministries and one has to get clearance from all the ministries. There is no single ministry that coordinates the logistics. Secondly, legal procedures are disjointed and take long time to get government clearances. Thirdly, customs procedures are long and cumbersome resulting in delays in delivery of cargo. Fourthly, there are multiple check posts and documents requirements which further delay the cargo delivery. Lastly, if the countries are not interlinked with improved transportation network, regional integration process will not move ahead at a desired pace.

To overcome the challenges, there are number of efforts and innovation practices going on in India with regard to infrastructure development. Firstly, to increase public investment in infrastructure, government has launched many programs including National Highways Development Project, National Maritime Development Programme. Secondly, an inter-ministerial committee (IMC) was setup to facilitate the development and implementation of a multi-modal infrastructure with the Ministry of Commerce and Industry as the node. It is still not very effective resulting in co-ordination issues between the agencies. Thirdly, the Multimodal Transportation of Goods Act, 1993, was framed to regulate the movement of goods involving more than two modes of transport from India to abroad based on a single, multi-modal transport contract. Fourthly, the foreign direct investment regulations permit 100% FDI under the automatic route for all logistic services except courier and air transportation services. Lastly, development of cross-border infrastructure like energy pipelines with neighboring countries is underway which is expected to contribute to the regional integration by reducing transportation costs and facilitating intra-regional trade and services. Thank you.

Q (Kishida): My first question is, in the beginning of your presentation you talked about the coastline of India, coastline of AP, and the administration of the ports, so are these 12 major ports administered at the country level and 139 non-major ports administered at the state level?

A (Raman): All the major ports are administered by the Government of India through individual port trust. The chairman of the port trust is an IAS officer, who works directly under the Government of India. The State government has no control over them. The 12 major ports work under Ministry of Shipping, Government of India. For non-major ports, each state has its own system. For example, in Andhra Pradesh, there is director of ports. In other states like Gujarat and Tamil Nadu, there is State Maritime Boards. Now, Ministry of

Shipping is insisting on having State Maritime Boards in each of the non-major ports states. Then, a CEO will be heading the State Maritime Boards.

Q (Kishida): Second question is, in India, is coastline erosion happening?

A (Raman): Breakwater system is in existence in India. Coastline erosion is also happening. There are statistics, but due to time constraints, it could not be got. In major ports, there is effective planning due to long-term historical perspective and research. In non-major ports, the developers are getting data, but the maritime board needs the expertise to monitor and prevent the coastal erosion. Hence, the planning is not thorough and not based on research and a better planning is required.

Q (Nakayasu): Under global situation, when a country creates a major port, it acts as a hub for the country. In India, does all 12 major ports act as hubs or only some out of them act as hubs? Can you explain the situation?

A (Raman): All the major ports are functioning as hubs. Amongst the non-major ports, only few are functioning as hubs, for example, Krishnapatnam port in Andhra Pradesh.

Presentation from Indonesia: Mr. Srie Handono Mashudi

Mr. Srie Handono Mashudi presented his inception report titled “Trees for Life.” Mr. Mashudi heads the Quality Management System (QMS) Department of National Road Implementation Body V (NRIB V), Directorate General of Highways in Surabaya, East Java Province. The QMS Department is a unit of technical implementation of National Road under Directorate General of Highway. This department is responsible for controlling, supervising, monitoring, and improving the implementation of public works in three provinces of Indonesia, east Java, Central Java, and the special region of Jogjakarta Province.

Considering the global and local environmental issues, the Directorate General needs not only experts but also managers of infrastructure development. One of the programs of NRIB V is to improve highway environment by planting trees that reduce air pollution. NRIB V has also collaborated with PT Djarum Kudus for Corporate Social Responsibility program. As a result of these programs, mahogany has been planted in East Java while Albizia Saman (Trembebsi) has been planted in Central Java because of their economic value and superior quality.

Albizia Saman absorbs more CO₂ compared to other trees, based on the data obtained from an institute in Bogor. The canopy of the tree is 15 meters wide. The tree can withstand heavy rainfall. It can grow in a wide range of altitude. With regard to Mahogany, it is easy to find and grows in dry area. Furthermore, the roots of both trees do not damage the pavement, the leaves and the seeds are not dangerous to the traffic, and they both grow very fast.

The total length of national roads in East and Central Java and Special Region of Jogjakarta is 3640 kilometers. The plan for this year is to plant Trembebsi in 193 kilometers in Central Java. The planting of the trees start from October 2010 with sapling height of 1.5 to 2 meters. The planting will be done in two stages; one, from Semarang to Pekalongan and second, from Pekalongan to Losari, the total length being 195 kilometers. The trees will be planted along the national road and will comply with national roads standard.

Mr. Mashudi also shared the execution photos and the progress of the tree plantation, from staking out by Directorate General of Highways team to planting the saplings to the various stages of growth of the trees. He explained that the canopy of the tree stops the light from reaching the pavement resulting in lower temperature of the pavement. This leads to longer life of the pavement and lower vehicle operating cost.

The communities living around the national road were also involved during the implementation of the program as well as the national universities. Thank you.

Q (Nishikawa): With the canopy, the life of the road can be extended. The tree shadow falls on the road extending the life of the asphalt. So, the tree protects the road. Was this one of the expectations in the past?

A (Mashudi): Because of the canopy, the people living around the national roads feel convenient. We can decrease the vehicle operating cost because of lower temperature of the pavement and the tires lasts longer. The pavement will also have a longer life.

Q (Nakayasu): Mahogany was mentioned as the most economical tree to plant. Is Mahogany cut after few years of planting on the roadside and sell them as lumber, for example?

A (Mashudi): It is hoped that mahogany is not cut for lumber. Mahogany is planted as a stimulant to the people around the national road as this is a good tree.

Q (Nakayasu): So, why do you think Mahogany is economical and desirable tree to be planted?

A (Mashudi): Mahogany has a good value and is planted with some purposes as has been mentioned in the presentation. The other purpose is to act as a stimulant for people living around the national highway. In Java Island, there is a variety in food crop and trees. Trees like Albizia and Tectona grandis has good value. So, Mahogany is also promoted as a tree to be planted along national road.

Q (Kishida): First question is related to the previous question. At NILIM, the absorption of CO₂ by trees is tested and measured locally and so there is a measurement result of this test. As was mentioned, the annual absorption rate was 28.5 tons per year, is this rate measured by an institute in Indonesia? Who is doing this measurement of CO₂ absorption rate?

A (Mashudi): The rate of measurement is from IPB Bogor. It was published in Trobos magazine #456, February 08.

Q (Kishida): Is the gentleman a university professor or from a national research institute?

A (Mashudi): He is from a national government institute in Bogor.

Q (Kishida): Second question, is there a database of the roadside trees, like the number of trees planted in the past and the kind of trees planted?

A (Mashudi): The data is in the flash disk and can be shown, if needed.

Break

Presentation from Myanmar: Mr. Khin Mg Swe

Mr. Khin Swe made a presentation on infrastructure development considering global and local environments for sustainable development of society from the slides. He pointed out that Myanmar has signed or acceded to or ratified a number of international environment conventions. Therefore, Myanmar is moving towards increased international engagement in environmental arena, and the government has also shown initiatives and some awareness in environmental issues.

In 1997, Myanmar became a member of Association of Southeast Asian Nations (ASEAN). ASEAN in recent times has been focusing on regional cooperation in dealing with environmental problems. To this purpose, ASEAN Regional Centre for Biodiversity Conservation was set up to empower communities in their ecoefficiency objectives. Mekong River Commission (MRC) is also another program in which Myanmar is involved. Such institutional mechanisms can be applied to engage the government at information-sharing and dissemination of current environmental affairs. This engagement can lead to training of officials for environmental assessment.

The Government of Myanmar adopted a policy of conservation and effective utilization of natural resources. Environmental protection and conservation occupy a special significance on national agenda of Myanmar.

Next, Mr. Swe presented organizational hierarchy of Public Works department which is under the Ministry of Construction. Public Works undertakes the construction and maintenance of major infrastructure of Myanmar. It has a multidisciplinary team of 12000 staffs including engineers and technicians.

The State Peace and Development Council is the highest authority of which Public Works is a part of. In the past, Public Works used labor-intensive method to implement a project. Now, although computers have been introduced, but due to absolute software and hardware, the highway management information system (HMIS) can only perform limited operation.

With the regard to budget allocation for new construction, it is allocated by the national budget directly to the Ministry of Construction. For maintenance purpose, maintenance budgets are provided which is of three types; routine, periodical, and special maintenance. Routine maintenance is done every year, while periodical maintenance is done every 4 years. Special maintenance is done only during special occasion. The allocated funds are not always adequate and have to be supplemented with supplementary budget.

Public Works is responsible for 34178 kilometers out of total 130050 kilometers of road network in Myanmar. From 1988 to present, Public Works has constructed 4263 bridges and 175 more bridges are under construction.

On private sector participation, Public Works introduced the build, operate, and transfer system (BOT) to encourage private sector participation. The government provided the land and infrastructure to the private entrepreneurs. They then built or improved the road and collected the toll for agreed time period. Foreign investors are also being encouraged to participate for upgrading infrastructure.

Today, due to underdevelopment and poverty, Myanmar faces a number of environmental challenges like deforestation, land degradation, etcetera, although air and water pollution is minimal due to low level of industrialization and low chemical use in agriculture. The challenges has three dimensions; institutional development, resource capacity, and environmental education.

In Myanmar, the environmental awareness is slowly gaining interest. Various development projects by departments and ministries integrate environment, but lack of proper institution still remains the main constraint. However, formation of NCEA and adoption of Myanmar Agenda 21 should help in solving the integration issue in the future. Thank you.

Q (Kishida): At present, as said in the presentation, Myanmar is implementing various environmental initiatives. When building long roads or bridges, there is considerable environmental impact. Do you do environmental assessment of such projects or has it been done in the past?

A (Swe): At present, Myanmar is trying to develop various infrastructures. The Public Works constructs roads and bridges all over the country. Myanmar being a developing country, there is less knowledge of environmental assessment, but it has been trying to develop it from other countries.

Q (Teramoto): First, Myanmar introduced private-public partnership in toll road construction and management. From the explanation, for 56 toll-road systems, 21 companies have studied this private-public partnership. Do you feel any disadvantages of this kind of system? Second, as you explained in the presentation, foreign companies are also invited for this partnership. Are there any Japanese companies participating or not?

A (Swe): The partnership is through build, operate, and transfer (BOT) system. Hence, all 21 companies are BOT companies. In constructing bridge, we have JFE from Japan in steel truss production.

Dr. Kishida thanked Dr. Swe for the presentation and also thanked other participants.

End of the Meeting

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Introduction to ICHARM and its Regional Cooperation activities on water-related disaster management - in partnership with ADB)

Summary of Minutes

1. Date and venue: 9:30–10:15 a.m.
Wednesday, November 17, 2010
International conference room
2. Participants

Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Katsuhito MIYAKE
3. Summary of discussion
 - (1) Lectures

The following two lectures were delivered as contributions to today's theme "Accommodating Climate Change."

 - 1) Information was presented on the representative activities of the International Centre for Water Hazard and Risk Management (ICHARM), engaged in activities contributing to the mitigation of water-related disasters in the world. The background to its foundation and its three mainstays of research, training, and information networking were discussed.
 - 2) Information was presented on the current activities of each country in the regional technology cooperation ICHARM, started in alliance with the Asian Development Bank (ADB) in November 2009.
 - (2) Questions and answers

Q (Mr. MASHUDI): I am in charge of expressway construction in Indonesia. In my country, sudden rainfall often interrupts construction work because of the insufficient ability to predict rainfall precisely. I wonder if ICHARM can contribute to the improvement of the present situation.

A (Mr. MIYAKE): The current flood prediction system offered by ICHARM does not predict rainfall because it provides information on rainfall after it has received observation results from the satellite. (Information provided by the agencies involved in the satellite operation does not contain predictions on rainfall at present). I wish to leave the problem of rainfall prediction for future consideration. I know that Indonesia is operating several radar rain gauges. I suppose that you may be able to obtain information that is useful for construction work if you establish a system that coordinates these gauges for data processing, and combine the system with the movements of rain clouds. I would suggest that you ask the Meteorological Agency in your country about this suggestion.

Q (Mr. SWE): Myanmar has been suffering from water-related disasters lately because of floods upstream and cyclones, particularly cyclone Nargis. I would like ICHARM to extend its assistance to Myanmar.

A (Mr. MIYAKE): ICHARM acknowledges Myanmar as one of the important countries. It invited the ex-secretary of Myanmar's Meteorological Agency to deliver a lecture last year. Some of ICHARM's researchers are carrying out simulations of storm surge inundation. We would like to present the

simulation results to Myanmar once reliable results are obtained. (In addition, ICHARM accepted a student from Myanmar onto its Masters course last year).

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Impacts of the climate change on the flood prevention and the adaptation measures)

Summary of Minutes

1. Date and venue: 10:30–11:15 a.m.
Wednesday, November 17, 2010
International conference room

2. Participants
Indonesia Mr. Srie Handono MASHUDI
Myanmar Mr. Khin Mg SWE
Japan Mr. Atsushi HATTORI

3. Summary of discussion

(1) Lecture

It was explained that Japanese utilization of flood-prone low-lying areas is highly sophisticated, but that the degree of safety from floods is relatively low in general and that there is concern about the growing risk of flood-related disasters due to the climate change predicted in the foreseeable future.

It was reported that the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) would implement multilayered flood-control measures, with a view to decreasing the number of victims to zero through adaptation measures.

It was explained that torrential monitoring technology using the X-Band Multiparameter Radar could be an example of the pioneering measures applicable to the increasingly visible changes in the climate.

The results of river discharge capacity assessment under the climate change were also presented in a preliminary study, to be considered when forming a long-term adaptation strategy. An explanation was given of the improvements necessary to secure the degree of safety stipulated in the water control policy when considering the increasing rainfall due to climate change.

(2) Questions and answers

Q: On the X-Band Multiparameter Radar

A: We exchanged opinions on the differences in specifications such as the resolution between the X-Band Multiparameter Radar and the conventional C-Band Radar, and also on the research into flood forecasting and warning in the future, which will use the X-Band Multiparameter Radar.

Q: On the increasing flood flow associated with the urbanization of the basin

A: We understand that in Indonesia, flow increases with the progress of urbanization, but this knowledge is not well incorporated into actual urbanization plans.

I think that the Japanese flood measures in the urbanized basin will be useful for the participating countries.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: New Role of Sewerage System in the Low-carbon Society)

Summary of Minutes

1. Date and venue: 11:15 a.m. to 12:00 p.m.
Wednesday, November 17, 2010
International conference room
2. Participants
Indonesia: Mr. Srie Handono MASHUDI
Myanmar: Mr. Khin Mg SWE
Japan: Dr. Masashi OGOSHI
3. Summary of discussion
 - (1) Lecture
A sewerage system is vital for a city to manage its waste. Besides collecting and screening out sewage and effluent, it channels these to the sewage plant, where pollutants are separated and eliminated to protect the water environment where the water will be discharged. Amid the recent moves to prevent global warming, and with the pursuit of sustainability in contemporary society, the role of the sewage plant is developing to involve the recycling of water and resources. In this lecture, Japanese approaches to the cyclic use of water and the cyclic use of resources in which the sewage plant plays the central role were introduced, and the problems arising from the cyclic use of resources were discussed.
 - (2) Questions and answers
Q (Mr. MASHUDI): Could you tell me how you distribute the treated water.
A: We distribute the treated water using double piping. That is, we build a pipe for sending treated water and another pipe for water services.
Q (Mr. SWE): Do hotels have such equipment?
A: Some hotels in Tokyo have such equipment.
Q: (Mr. MASHUDI) Do you have an established system for the use of treated water?
A: Though not mandatory, the Tokyo Metropolitan government asks for buildings with a large floor area to have a system for the use of treated water.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Newly-Proposed Operation Rules against Floods Exceeding Design)

Summary of Minutes

1. Date and venue: 13:00–13:45
Wednesday, November 17, 2010
International conference room

2. Participants:
Indonesia Mr. Srie Handono MASHUDI
Myanmar Mr. Khin Mg SWE
Japan Dr. Shinya MITSUISHI

3. Summary of discussion

(1) Lecture

It was explained that recently, dramatic improvements had been made in the research into dam operation methods. Damage to the flooded area is minimized by setting the optimal amount of advance release and maximum release. This is achieved through the integrated operation of the dam's flood-control capacity and water utilization capacity, based on rainfall predictions that utilize the Water Research and Forecasting (WRF) Model.

The flood adjustment system widely adopted in Japan was introduced, and the problems associated with it were explained. At the same time, the rational flood adjustment method using rainfall prediction and management of its prediction error was discussed, the simulation results for dams across the country using the flood data were shown, and the effectiveness of this method was explained.

In addition, flood adjustment examples carried out in the field were presented. The management of prediction error to strengthen the function and measures to improve the facilities were explained.

(2) Questions and answers

Q (Mr. MASHUDI): It is an important point of view that the dam should be managed taking the risk into consideration. What flood adjustment method do you use if the actual rainfall exceeds the predicted rainfall?

A (Dr. MITSUISHI): We compare the available storage capacity of the dam with the volume of inflow, and discharge water in advance if the available storage capacity is insufficient. We increase the outflow rate by considering the available storage should further storage be needed.

Q (Mr. MASHUDI): The shortage of available storage due to the accretion of sand has become the biggest problem in dam management, and planting in the basin is underway in Indonesia. What measures are being taken in Japan?

A (Dr. MITSUISHI): Some dams are nearly 100 years old, and measures for the accretion of sand have also become a big problem in Japan. In addition to constructing bypasses for sand elimination and implementing dredging, some dams like the Unazuki Dam have had sand elimination gates installed.

Q (Mr. MASHUDI): Some dams, including the one on the Blantas River, have a gate, and the gate is opened for sand elimination in our country. However, it is impossible to construct a gate in some dams, including the dam on the Soro River, because they are vital for fishery or because they have big cities downstream. Planting is not problem-free because we cannot solve some mounting problems such as illegal harvesting, and our inability to solve these is a big problem. In fact, problematic planting is related to shore erosion.

A (Dr. MITSUISHI): Japan had many clear-cut areas in the Edo period and in 1945. Planting has brought Japan to its current situation. Dams in Japan are planned on the assumption that the forest in the basin is well managed. The accretion of sand in the dam has made river-bed degradation and environmental deterioration visible.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Sediment Disaster Forecasting and Warning System)

Summary of Minutes

1. Date and venue: 13:45–14:30
Wednesday, November 17, 2010
International conference room
2. Participants
Indonesia Mr. Srie Handono MASHUDI
Myanmar Mr. Khin Mg SWE
Japan Mr. Masaki MIZUNO
3. Summary of discussion
 - (1) Lecture
The Japanese sediment disaster forecasting and warning system traditionally organized rainfall records obtained during disaster periods and normal times, and predicted the occurrence of a sediment disaster on the basis of whether or not the snake line was above the limit of the sediment disaster risk occurrence baseline (straight line).
However, because this method had several problems, Japan has adopted a method for determining the critical line (CL) using the Radial Basis Function Network (RBFN), which is a kind of neural network, and has set up standards for information on sediment disaster warnings.
The setup method, announcement procedure, and actual operation examples in disasters of the Japanese sediment disaster forecasting and warning system (sediment disaster warning information based on the RBFN) were introduced.
 - (2) Questions and answers
On the response of the sediment control facilities after the eruption of a volcano
Q (Mr. MASHUDI): Mt. Merapi is erupting, and the sediment control dam is buried because of ash-fall sediment in Indonesia. Do you have any suggestions as to what we should do?
A (Mr. MIZUNO): You need measures to decrease the damage due to the migration of sediment after ash fall. I will use the response to the eruption of Unzen and Fugendake in 1991 as a case example when Japan implemented hardware-based measures (except such software-based measures as raising the alarm and evacuation).
For the urgent protection of objects subject to conservation from the sediment disaster after ash fall, we repeatedly eliminated stones in the existing sediment control dams, built emergency sediment storage places, and installed tentative channelizing dams outside the off-limit area.
For fundamental mudflow measures, we constructed sediment control dams and channelizing dikes (in the downstream direction of the approaching mudflow) as shown in Figs. 1 and 2. In addition to these, we revamped the Mizunashi River (for example, by eliminating, burying, by blocking sediment, and by widening the buffer zone to reduce and eliminate flood energy).



Fig. 1: Image of the completed sediment control facilities on the Mizunashi River of Unzen and Fugendake



Fig. 2: Improvement plan of the sediment control facilities on the Mizunashi River of Unzen and Fugendake

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: ITS Deployment in Japan)

Summary of Minutes

1. Date and venue: 9:00 –9:45 a.m.
Thursday, November 18, 2010
International conference room
2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Fumihiko KANAZAWA
3. Summary of discussion
 - (1) Lecture

The concept of “Smart Way” was explained, together with its realization through road-to-vehicle communication technology that uses Dedicated Short Range Communications (DSRC: spot communications) in the 5.8-GHz bandwidth, as employed by electronic toll collection (ETC) in Japan.

The history of research and development to date was presented. The outline of the intelligent transport system (ITS) spot service, scheduled for full-scale development beginning in 2010, was introduced, and available services like dynamic route guidance, safety driving support, IP connection, and services under development (utilization of probe information, settlement services, and logistics support) were discussed.
 - (2) Questions and answers

We exchanged opinions mainly on the following subjects.

On the safety driving support service

Q: Please tell us about the responsibility for an accident that occurs due to the service being down and failing to give the necessary safety information.

A: This service is to support the driver. The driver is responsible for the accident, and I think the system is not liable for it.

On the obligations of the private sector

Q: Does the private sector have obligations for the future development of the ITS spot service?

A: This service is offered through collaboration between the government and the private sector. The government improves the infrastructure, and the private sector is responsible for the manufacturing and sales of onboard units and roadside equipment, as well as follow-up services. The government does not give orders to the private sector, and the private sector has no obligations to the government.

It is similar to the case of the ETC, which is used by more than 90% of expressway users.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Actions of road traffic measure to contribute reduction Greenhouse Gas from transport section and improvement of air quality on roadside in Japan)

Summary of Minutes

1. Date and venue: 9:45 -10:35 a.m.
Thursday, November 18, 2010
International conference room

2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Manabu DOHI

3. Summary of discussion
 - (1) Lecture

The emissions of “greenhouse” gases from the road traffic sector in Japan were explained, and the legal system and basic ideas for the reduction of emissions were introduced.

The history, present situation, legal system, and improvement measures for roadside air quality in Japan were also introduced.

Subsequently, specific explanations were given about the road traffic policy effective for both of the above two problems, that is, the policy for cars, and the policy for roads. The importance of an integrated approach for the reduction of emissions from various fields, such as car, road, and traffic, was discussed.

In this discussion, the participants agreed on the importance of having an integrated approach to solve the above problems.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Promotion of roadside noise abatement based on Environmental Impact Assessment)

Summary of Minutes

1. Date and venue: 10:45 - 11:30 a.m.
Thursday, November 18, 2010
International conference room
2. Participants
India Mr. Koneru Venkata RAMANA
Indonesia Mr. Srie Handono MASHUDI
Myanmar Mr. Khin Mg SWE
Japan Mr. Hiroshi YOSHINAGA

3. Summary of discussions

- (1) Lecture

The present situation of roadside noise was explained, and a brief summary of measures for noise reduction and environmental impact assessment was given. In terms of the present situation, it was mentioned that environmental standards are set as administrative objectives on the basis of the Environment Basic Law. An example was given: despite the fact that noise exceeding the environmental standards is observed in about 10% of residences, in many of them noise does not pose a problem on the roadside even though it exceeds these environmental standards. In terms of noise-reduction measures, a brief summary of each of the measures for noise sources, noise propagation channels and noise receiving was explained. Subsequently, the sound insulation wall (as a noise propagation channel) and the drainage pavement (as a measure for the noise source) were discussed in a little more detail. Lastly, the necessity of working on possible noise-control measures in the planning stage was explained. It was also mentioned that the National Institute for Land and Infrastructure Management (NILIM) is conducting research on methods for noise estimation and assessment.

- (2) Questions and answers

- Q: Please elaborate on the Japanese environmental standards of 45 dB in the daytime and 40 dB in the nighttime stipulated for inside a building.
- A. It is close to the conditions if no one were to speak in the conference room.
- Q. I wonder if the sound from a car horn is noisy. Is it regulated?
- A. Because Japanese drivers observe safety rules very closely, they rarely sound the horn. The sound of the horn is not regulated. The regulations for altered mufflers were intensified last year because these are the subject of many complaints.
- Q. What material is used to strengthen the acrylic sound insulation wall? Is it a grid material?
- A. It is made of nylon code, and it is in strips, not in a grid.
- Q. When will the current "engineering method of environmental impact assessment" be revised?
- A. It is scheduled to be revised in two years.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Pavement Technologies in Japan ~Measures against Environmental Issues~)

Summary of Minutes

1. Date and venue: 11:30 a.m. to 12:15 p.m.
Thursday, November 18, 2010
International conference room
2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Iwao SASAKI
3. Summary of discussions
 - (1) Lecture

A brief summary was given of the surveys and research on pavement technologies that Japan is developing and implementing as a solution for environmental problems such as the global environment (carbon dioxide emissions), the urban environment (heat island), and the roadside environment (pedestrians' heat environment).

Recycling has been adopted as a pavement technology that is helpful for the reduction of carbon dioxide emissions. The process and the present situation in terms of the recycling of pavements in Japan were introduced, as well as the construction method for recycling pavement materials and the results of calculations of reduced carbon dioxide emissions. At the same time, the ideas of utilizing the recycling methods of other industries, water-retentive pavements helpful for the reduction of road surface temperature, and heat-shielding pavements were introduced, and case examples estimating the effects of these pavement technologies were explained.
 - (2) Questions and answers

On the aggregate size of recycled hot asphalt mixture
 - Q. Recycled asphalt concrete is supposed to have a smaller aggregate size if old crushed materials are reused in it.
 - A. A certain amount of new aggregate (and new asphalt) is added and mixed with the recycled asphalt concrete, and the production plant designs the mixture of recycled asphalt concrete by setting the size of the new aggregate as coarse, in order to achieve the optimal aggregate size in each production.

On the repeated usage of pavement as paving asphalt recycling
- Q. How many times is asphalt concrete recycled?
- A. The answer is different for urban and rural areas. According to material usage statistics compiled by the Public Works Research Institute and the estimates of pavement asset stock, more than 50% of pavements are recycled at least once. In combination with the increasing usage of modified asphalt, we observe signs of the decreasing penetration of asphalt (development of material oxidation) in the pavement materials used within Japan.

On the construction method of recycled asphalt pavements and the unit prices of the materials

Q Three kinds of recycling technologies are available for asphalt: hot-mix asphalt recycling, warm-mix recycling, and cold(ambient)-mix recycling. Please tell us the price of each recycling technology.

A The hot-mix asphalt recycling costs less than the production of new asphalt, because there are no expenses for disposing of asphalt concrete wastes, and because it can reduce the amount of new asphalt required for production. The warm-mix asphalt recycling costs more than the production of new asphalt at present, but there are ongoing efforts that ask the user(road authorities) to bear the increased cost incurred by using the system, such as the green procurement adopted last year.

On the cost to make an asphalt mixing plant suitable for recycling

Q Please tell us the cost for the modification of an existing mixing plant to make it suitable for recycling.

A. I do not have detailed information because I am not on the producers' side, but I am informed that it does not cost much in comparison with the cost of all the equipment. The indirect heating type only requires equipment to input recycled aggregates(used asphalt) into the mixer, and even the attached dryer heating type requires only the building of a dedicated dryer for recycling, and equipment for the storage and supply of recycled materials.

Other comments

- Mandatory policies like the green procurement are very effective for making recycling technology more widespread, but it is necessary to discuss their pros and cons carefully because we are observing signs of the decreasing penetration of the asphalt (development of material oxidation), that is, signs of rapid deterioration of asphalt stock as road pavement assets.
- The reasons for the in-place recycling method not being widespread in Japan are as follows: (1) there are too many fixed recycling plants already installed; (2) there is limited space available for constructing in-place recycling plants; and (3) porous asphalt pavements are already popular. However, technology transfer looks promising because cases suitable for the in-place recycling method are supposed to be abundant in foreign countries.

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: The external force estimation for adaptation measures of storm surge protection in Japan)

Summary of Minutes

1. Date and venue: 13:00–13:45
Thursday, November 18, 2010
International conference room
2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Kenzi NOGUCHI
	Dr. Hirouki KISHIDA
3. Summary of discussion
 - (1) Lecture

The present situation of the Japanese coastline was introduced. The major problem for coastal protection in Japan is coastal erosion. On the assumption that climate change is related to coastal erosion, Japan's policy on climate change and our present knowledge of the changes in ocean waves, typhoons, and tidal levels were introduced.
 - (2) Questions and answers

Q (Mr. MASHUDI) Cyclones gradually erode the coastline in Indonesia. Do you have any good suggestions for the prevention of coastal erosion, because people working in the fishing industry are worried that they will lose their livelihoods in the future?

A (Mr. NOGUCHI) You need to know whether the coastal erosion due to cyclones is temporary or advancing slowly, because the measures to be taken can vary depending on this. If it is temporary, you have to wait, without erecting any structural objects on the coastline, because the coastline will certainly recover.

A (Dr. KISHIDA) You have to take measures such as beach nourishment, sand bypassing, and sand recycling, either temporarily or permanently. Erecting structural objects is an easy and lasting method. However, it causes side effects. It may be feasible to prevent the structural objects from being washed out to sea by constructing many small jetties.

A (Mr. NOGUCHI) I would suggest that you consider creating a reef effect instead of destroying the fishery. Methods for protecting the beach scarp through sand packing using geotextiles and geotubes are available. I read an article on such measures taken on the coastline of your country (India).

The 19th Meeting on Public Works Research and Development in Asia
Discussion on Specific Subject

(Subject: Water Quality Improvement and Change of Environmental Concern for Rivers in Japan)

Summary of Minutes

1. Date and venue: 13:45–14:30
Thursday, November 18, 2010
International conference room
2. Participants

India	Mr. Koneru Venkata RAMANA
Indonesia	Mr. Srie Handono MASHUDI
Myanmar	Mr. Khin Mg SWE
Japan	Mr. Kunihiko AMANO Mr. Hiroaki TERAMOTO
3. Summary of discussion
 - (1) Lecture

The history of water quality in Japanese rivers was introduced, and it was shown that the water environment is affected by various kinds of human activity because the change of environmental factors other than that of water quality occur concurrently. The history of the environment in the basin of Ise Bay was used as a case study.

At the same time, brief explanations were given of the human influence on Japanese rivers, and of the resulting effects and measures for their mitigation.
 - (2) Questions and answers

(Mr. TERAMOTO) I wish to know the water quality of the Ganges River.
(Mr. RAMANA) The Ganges River is a holy river from a religious perspective, but in fact, water pollution there is worsening.