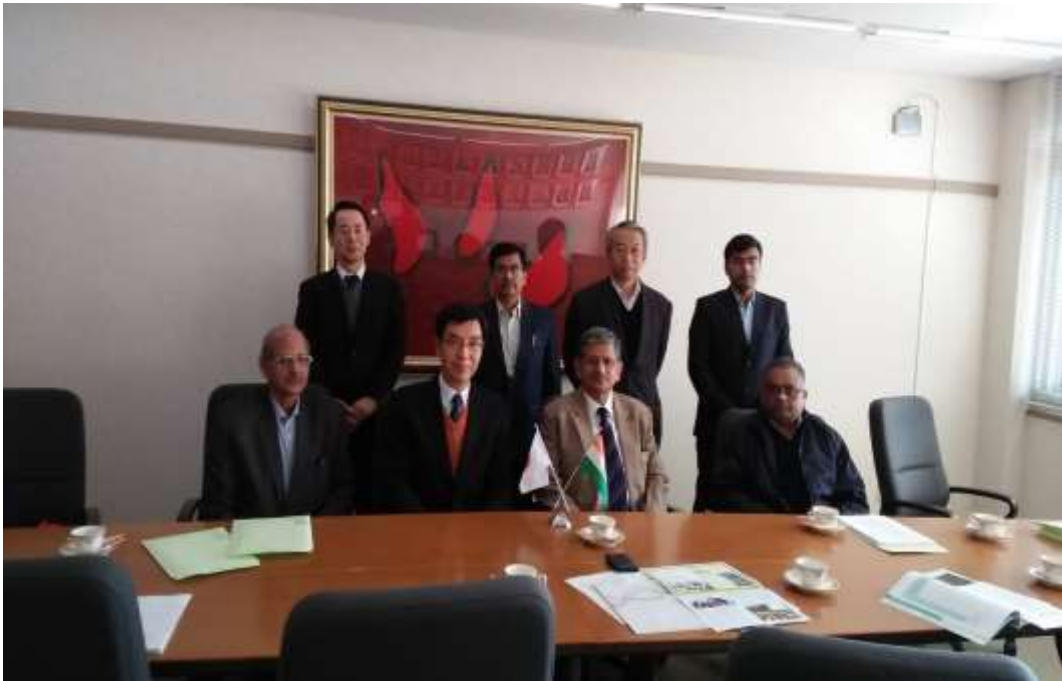


GOVERNMENT OF BIHAR WATER RESOURCES DEPARTMENT



(AT YAMAGUCHI UNIVERSITY)

**Report on Study cum Exposure visit to Japan under South
Asia Water Initiative (SAWI) Project – A World Bank
Administered Project(Dt.14th -20th Dec. 2016)**

Report on Study cum Exposure visit to Japan under South Asia Water Initiative (SAWI) Project – A World Bank Administered Project(Dt.14th -20th Dec. 2016)

Under World Bank Administered South Asia Water Initiative (SAWI) Project, a delegation of five members from Water Resources Department, Govt. of Bihar headed by Honourable Minister, Water Resources Department, Govt. of Bihar visited Japan as “Study cum Exposure visit” from 14th Dec 2016 to 20th Dec 2016..The delegation consist of: -

1. Mr Rajiv Ranjan Singh, Minister, WRD, Govt. of Bihar, Patna
2. Mr. Arun Kumar Singh, Principal Secretary, WRD, Govt. of Bihar, Patna
3. Mr. InduBhushan Kumar, Engineer-in- Chief (HQ), WRD, Govt. of Bihar, Patna
4. Mr. Anil Kumar, Joint Director, Hydrology Directorate, WRD, Govt. of Bihar, Patna
5. Mr. Chandan Kumar, Assistant Director, FMISC, WRD, Govt. of Bihar, Patna

The visit was accorded vide Govt. Order No.-FMISC-39/2016-460 Patna dated 08.11.2016. The visit was coordinated by Mr. Yoshiyuki Imamura, Professor, Advanced Science and Innovational Research Center, Organization for Research Initiatives, Yamaguchi University, Tokiwadai 2-16-1, Ube, Yamaguchi , Japan.

OBJECTIVE

The objective of the Study cum Exposure Visit is to acknowledge how Japan is doing flood forecasting and early warning and adopt the technology suitable for the State of Bihar.

TOUR DETAILS

The delegation reached Tokyo on 14.12.2016 and visited **Tokyo University, Tokyo, Japan** on 15th Dec 2016. The programme started with welcome remark by Prof. Yoshiyuki Imamura.

After that a presentation was given on Cell Phone Call Data Recording (CDR) Analysis for Flood Risk Management by Prof. Ryosuke Shibasaki and his team. It was highlighted that information of people distribution/movement on the basis of CDR “where, how many” is a significant factor, will be a tool for flood risk management.



PRESENTATION ON CELL PHONE CALL DATA RECORDING (CDR) ANALYSIS FOR FLOOD RISK MANAGEMENT AT TOKYO UNIVERSITY, TOKYO, JAPAN

The proposed solution to the above mentioned problem is (i) Estimating people distribution/movement with data from cell phone CDR system to better monitoring and understanding behaviour and activity of people during flood (Call Detail Record data analysis) (ii) Deploying location-based warning system to people in possible affected area (SMS via operator). But have limitation of CDR as (i) Not all movements are recorded (ii) Representing only a part of total population (i.e. cell phone users) (iii) Anonymized (No demographic attributes) (iv) Data is too big (billions of record).

The delegation visited **Okayama River Management Office**, Cyugoku Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan on 16th Dec 2016. The programme started with opening remark by Prof. Yoshiyuki Imamura followed by introduction of the members from both side.



PRESENTATION AT OKAYAMA RIVER MANAGEMENT OFFICE (MLIT) ON
DISASTER MANAGEMENT & RIVER MANAGEMENT



FLOOD MATERIAL STORAGE SITE AT OKAYAMA



FLOOD MATERIAL STORAGE SITE AT OKAYAMA



HELIPAD AT FLOOD MATERIAL STORAGE SITE

After this, presentation was given on Disaster Management & River Management in Japan by member from Okayama River Management Office. The highlight of disaster management system of MLIT is as following:-

(i) **Disaster Prevention** :- As public facility administrator, it has the responsibility of (a) Improvement and management of disaster management facilities (e.g., levees, flood gates and so on) (b) Improvement and management of disaster resilient facilities (e.g., roads, ports etc.)

(ii) **Emergency Response**: - MLIT as public facility administrator, has established the system that enables immediate response to a disaster. It also provides prefectural governments and municipalities with necessary supports by use of TEC-FORCE system.

(iii) **Disaster Recovery**: - As public facility administrator, MLIT raises funding and implements various projects. It also manages disaster recovery system (evaluation of a disaster and decision making on the selection of an adequate project)

(iv) **Rehabilitation**: -MLIT provide assistance for construction of resilient towns against disaster (e.g., Law on Tsunami Disaster Management Regional Development and so on)

After Presentation & discussion with River Management Officials in Japan it became clear that themost of land in Japan are covered by mountains, and people and assets are focused in the narrow plain area. There is concentration of population and assets in flood-prone area. Many rivers in Japan are very steep running with a short distance from the origination and finally meet to sea, resulting in rapid flow. In the case of water resource management including flood management, River Managers are designated in accordance with the “River Law”. Responsibilities of River Managers are monitoring, planning of water resource management system, and its implementation. Once disaster occurs, River Managers are the first responders for early recovery and reconstruction of river infrastructures. Non- structural measures for alleviating flood damage:-

(i) Provision for river information to public either by radio, TV, Internet etc.

(ii) Emergency response for heavy rain

(iii) Flood-fighting activities during floods

(iv) Publication of flood-prone area map (flood hazard map)

(v) Radar observation of precipitation

After the presentation the delegation was acknowledged by the River Management Authority about the storage of materials used during flood.It was observed that at the storage site there was a helipad which is being utilised

during flood as and when required to facilitate the work. Subsequently, the delegation went for site visit to see how the flood management work being carried out on the river bank and also to acknowledge about the function of hydromet station installed at the river bank. . It was found that at that hydrometstation; Precipitation, Water Level & Discharge was measured and sent to Control Room by using radar/sensor.

The delegation visited **Yamaguchi University**, Ube, Japan on 19th Dec 2016. A seminar was organised on Innovative technology on disaster risk management and water resources management. The seminar started with opening remark of Prof.Fusanori Miura, Vice President Yamaguchi University, Japan.



DISCUSSION AT YAMAGUCHI UNIVERSITY



PRESENTATION BY YAMAGUCHI UNIVERSITY ON FLOOD RISK MANAGEMENT

A presentation on “Future plan of international cooperation of Center for Research and Application of Satellite Remote Sensing of Yamaguchi University” was given by Prof. Fusanori Miura. It was pointed that satellite remote sensing can be used for preparedness and quick response in case of disaster management as well as in evacuation. Immediate grasp of the damage and situation can be analysed through available satellite imageries and basic information can be supplied for hazard maps. It was concluded that satellite data can be applied to detect flood zone due to heavy rain, research work can be promoted to reduce & mitigate disaster and to build a bridge between foreign countries and Japan.

A presentation on “Effect of hazard map on consciousness of flood disaster prevention” was given by Prof. Koji Asai. He pointed out that due to climate change & global warming there is increased risk of flood. Although hard measures like dyke, dam, etc are very important but also soft measures like hazard map is also important.

A presentation on “Displacement monitoring for risk management of infrastructures using space technologies” was given by Prof. Norikazu Shimizu. It was highlighted that slope displacement due to land slide can be assessed by this technique. It was concluded that space technology, SAR & GPS can be used for managing disaster risk management.

A presentation on “Passive microwave observation of earth’s water from space” was given by Associate Prof. Keijilmaoka. This technique can be used in measurement of precipitation and soil moisture. Its limitation is that it can be used for large area and not for small area.

A presentation on “Space technology utilization for urban environment” was given by Associate Prof. Masahiko Nagai. It was highlighted that this technology can be used in (i) to make a digital copy of real world(ii) automatic building extraction, automatic tree detection (iii) flood area detection from change of population distribution.

A presentation on “Evaluation of the upstream water level of the submerged weir” was given by Prof.KesayoshiHadano.



SOIL STABILIZATION WITH ANCHORING BOLT

Japan has done good work in Soil Stabilization in hilly slope area. Due to excessive rainfall, soil on hilly slope gets erosion which cause landslide. It was found that

concreting work with anchoring bolt has been used. This technique has found the most appropriate measures on hilly slope on highway as well as city sides.

The delegation visited International Centre for Water Hazard and Risk Management (ICHARM), Tsukuba, Japan on 20th Dec. 2016.



PRESENTATION BY ICHARM ON FLOOD RISK MANAGEMENT



GROUP PHOTOGRAPH AT ICHARM

The programme started with opening remark of Mr. Toshio Koike, Director, ICHARM. A presentation on “ICARM” was given by Mr. Toshio Koike. He highlighted the long term targets of ICHARM which are given below:-

- i. Data & Statistics**
 - a. Promoting data collection, storage. Sharing and statistics
 - b. Integrating local data, satellite observations and model output
- ii. Risk Assessment**
 - a. Developing integrated disaster risk assessment
 - b. Identifying locality and commonality
- iii. Risk Identification**
 - a. Monitoring & Predicting changes in disaster risk
 - b. Identifying locality
- iv. Support in Sound Policy-making**
 - a. Analysing and formulating policy ideas
 - b. Visualising values of preparedness and investment efficiency
- v. Support in Community of Practice**

- a. Improving disaster literacy
- b. Promoting co-design and co-implementation among stakeholders.

It was stated that delivering best available knowledge to local practices is a challenge to ICHARM. Flood-related risk management is the 1st phase focus and can be achieved through information networking, training and research. Capacity development programme is also conducted at ICHARM. Master course on Water-related disaster management with GRIPS (National Graduate Institute for Policy Studies, Ph.D. course on Disaster Management with GRIPS are also conducted at ICHARM. International Flood Initiative (IFI) implementation framework was also mentioned in the presentation which are data & statistics, risk assessment, risk change identification, support in sound policy-making and support in community of practice. There was some highlight on Hydrometeorology- Agriculture Droughts Prediction System. Under this DIAS (Data Integration and Analysis System) is used to create knowledge enabling to solve the Earth environment problems, to reduce the disaster risk, and then, to generate socio-economic benefits.

During Presentation, ICHARM stated that this institute is working on the Flood related risk management in Thailand, Bangladesh and other countries.

After the presentation; it was stated by the team that the state of Bihar is facing water related problem in the form of Climatological disaster, Hydrological disaster as well as Meteorological disaster. The main issues are that we are in lacking of information receiving from neighbouring country to manage the flood due to heavy rainfall. It require cooperation from ICHARM in the field of Innovative Research, Training & Capacity enhancement & Data Networking in the aspect of flood forecasting & early warning.

Conclusion:-After presentation by various Institute & with discussion, points which emerged are as below: -

- i. Cell Phone Call Details Record (CDR) Technology is a better tool which gives information regarding public movement/distribution during occurrence of disaster, on the basis of which better management can be carried out in the affected location. This technique should be adopted in the state during heavy rainfall to warn the public or in evacuation in a particular zone.

- ii. We should develop a mechanism/infrastructure for storage of materials required to manage flood risk/disaster in a scientific manner so that damage of such materials are negligible. Before monsoon period; proper camp should be ready at site so that adequate materials can be stored as well as if needed may be dropped or made available without any delay.
- iii. The Soil Stabilization technology of Japan may also be adopted in this State during construction of hydraulic structure such as dam/barrage/weir and also in highways construction in hilly terrain where there is the possibility of Soil Erosion.
- iv. To manage flood risk, we should consider new technology like microwave, space technique for which Engineers may be trained from various Research organisation like Yamaguchi University, ICHARM which are working in the field of Flood Risk Management.
- v. We should also consider the collective framework needed to minimise flood risk hazard and also to prepare hazard map. Project Design Matrix should also be developed to minimise risk.
- vi. Structural Infrastructure should be given more priority but non-structural activities like research, acknowledgement of new technique should also be considered.
- vii. We should consider Integrated Flood Initiative strategy to minimise Social, Environmental as well as Economic issues to get maximum benefit using flood plain.
- viii. Bangladesh is doing flood forecast and early warning – 5 days lead period with the help of World Bank. Such facility should be developed in the state of Bihar.