Japan-Egypt Hydro Network (JE-HydroNet)  
Joint Project in Science and Technology

Japan Egypt Hydro Network and 
Risk Reduction Management in Different  
Transportation Sectors

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The two biggest disasters in the past decade were:

- the earthquake of 1992 and;
- the flash floods that occurred 1994, 2010 in Upper Egypt.
Disasters in Egypt

<table>
<thead>
<tr>
<th>Disaster</th>
<th>Date</th>
<th>Affected (no. of people)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td>1994</td>
<td>160,660</td>
</tr>
<tr>
<td>Earthquake*</td>
<td>1992</td>
<td>92,649</td>
</tr>
<tr>
<td>Flood</td>
<td>2010</td>
<td>3,500</td>
</tr>
<tr>
<td>Flood</td>
<td>1995</td>
<td>3,000</td>
</tr>
<tr>
<td>Flood</td>
<td>2002</td>
<td>800</td>
</tr>
<tr>
<td>Mass Movement Dry</td>
<td>2008</td>
<td>697</td>
</tr>
</tbody>
</table>

Percentage of reported people killed by disaster type:

- Earthquake*: 36.8%
- Flood: 43.8%
- Mass mov. dry: 8.6%
- Storm: 6%
- Epidemic: 1%
- Ext. temp.: 3.7%
Roads Disaster Risks

Disaster risk by roads can occur through human and natural disaster

- Egypt loses about 12,000 lives due to road traffic crashes every year.
- It has a road traffic fatality rate of 42 deaths per 100,000 population.
- Majority (48%) of those killed are passengers of four-wheelers though pedestrians also constitute 20% of these fatalities.
- In addition, there is no adequate provision of infrastructure for non-motorized modes of transport.
- Floods. In Egypt as example we receive once per year high amount of rain specially in South Sinai and in upper Egypt, where thereby the main roads get destroyed and are closed for the traffic for a long time. Policies and strategies with engineering solutions has been done to minimize the disaster risks through such rain showers. But still we need more observation and forecasting for the weather in such areas to avoid any coming destruction for these roads.
Flash Flood Hazard in Egypt in 2010
JE-HydroNet BACKGROUND

• The gap between education, research and practice in the hydraulics and hydrology field is recognized by many;
• Bridging the gap can be achieved by involving the practitioners in education and training;
• Engineering projects are becoming more complex projects and have to be carried out by several experts of different disciplines and locations;

A joint project for research and education was established between DPRI, Kyoto University and three institutional research units in Egypt.

2010 DPRI, Kyoto University initiated Japan Egypt-Hydro Network (JE-HydroNet);

The Second JE-HydroNet Symposium was at GUC, Egypt 20-21 March 2012;

This network was developed from the problems facing the Nile Delta, Nile River system, and coastal managements in Egypt;
Database of JE-HydroNet
(http://wrrc.dpr.i.kyoto-u.ac.jp/database/htm/home.htm)
Problems Facing Nile River System and Delta of Egypt

**Vulnerability of the Nile River and Delta of Egypt**

**Upstream and in Nasser Lake**
- Environmental risks
- Sedimentation
- Evaporation
- Aswan high dam (AHD) operation
- Impacts of dams upstream of AHD
- Sediment management techniques

**Downstream of Aswan High Dam**
- Social behavior
- Water quality and water pollution
- Global warming and climate change
- Traditional irrigated system
- Limited available water resources
- Water-logging
- Rise in groundwater levels
- Flash Flood

**Delta, Irrigation and Drainage Networks**
- Nile Delta flooding by sea
- Environmental degradation
- Competing uses of land
- Inefficient natural resources management
- Salt water intrusion
- Negative impact of free crop pattern
- Degradation of agricultural soil fertility

**Coastal**
- Potential impact of sea level rise
- Coastal erosion
- Sea level rise
- Negative effects on fisheries
- Climate change

**Energy Resources**
- Climate change

First Mini-Symposium
October 26th (Tuesday), 2010
Salle D1518, Uji campus, Kyoto University
Organized by Water Resources Research Center, Disaster Prevention Research Institute, Kyoto University

- Impacts of climate changes on the Nile Basin and the Delta of Egypt
- Integrated water resources managements including irrigation and ground water
- Reservoir sustainability management
- Coastal management
- Flash flood disaster management
The Second JE-HydroNet Symposium on the Nile River System and the Delta of Egypt
March 20-21, 2012
The German University in Cairo, New Cairo Egypt
Auguts 2014 JE-HydroNet Seminar for Cemented Sand Gravel (CSG) Dam Project attendees from Embassy of Japan in Cairo, JICA office, Ministry of Water resources and GUC The German University in Cairo, New Cairo Egypt
Hazards – Exposure – Vulnerability - Risk

- **Hazards** is a potentially damaging natural or human induced phenomenon, material, anthropological activities, which may cause loss of life, injury or other health impacts, property damages, loss of livelihood and Socio-Eco disorders.

- **Exposure** is the degree to which the element at risk are likely to experience hazard events of different magnitude.

- **Vulnerability** is the characteristics and circumstances of a community, system that make it vulnerable to the damaging impacts of a hazard. This may arise from various physical, social, economic and environmental factors.

- **Risk** is the combination of probability of an event to happen and its negative consequences.
Processes of Risk Reduction Assessment

The impacts from hazards can be reduced by investing in mitigation measures. Creating a mitigation strategy is a high priority for risk reduction.

Hazard Identification
- Fire
- Explosion
- Natural hazards
- Hazardous materials spill or release
- Terrorism
- Workplace violence
- Pandemic disease
- Utility outage
- Mechanical breakdown
- Supplier failure
- Cyber attack

Assets at Risk
- People
- Property including buildings, critical infrastructure
- Supply chain
- Systems/equipment
- Information Technology
- Business operations
- Reputation of or confidence in entity
- Regulatory and contractual obligations
- Environment

Impacts
- Casualties
- Property damage
- Business interruption
- Loss of customers
- Financial loss
- Environmental contamination
- Loss of confidence in the organization
- Fines and penalties
- Lawsuits

Vulnerability Assessment

Probability & Magnitude

Impact Analysis

www.ready.gov/risk-assessment
Road Safety in developing Countries has been researched and discussed from several researchers and institutes several times within the last century.
Freight Transport in Egypt

~ One Million Ton/year Freight

95% on Road Transport
4% Railway Share
1% River Transport share
Looking at these figures it is obvious that something is wrong in our Transport system.
Therefore and due to the high % share of using our road network the number of Accidents increased dramatically in the last years from 8000 mortalities and 30,000 injuries in the year 2000 to 12,000 mortalities and 55,000 injuries by the end of year 2009.
In Egypt the Freight Transport on the road network with this high % using trucks and trucks with trailer is causing several problems especially in Road Safety. Therefore, the only way is to increase the Rail and River Transport share in Freight Transport.
We have to encourage the use of Mass Transit Public Transport modes with high quality of services and reasonable fees for the different society levels.
In Passenger Transport an integrated network of variety of transit technologies must be implemented to create an effective transportation system. Different technologies can be appropriate in different areas of the city to serve a range of capacity and service demands.

This is what we call a completed good integrated Transport System.
Complete Integrated Transport System needs to be:

User – Focused
Valued and
Seamless

Complete Integrated Transport System

Efficient

Sustainable
This complete Integrated Transport System needs:

• Real time knowledge of the different transport networks.
• Tools to influence behavior.
• Proactive management of the different network.
• ICT (Information communication Technology) & ITS (Intelligent Transportation System) are fundamental to complete Integrated Transport system.
• Strong delivery arrangements are important.
• Financial and Funding possibilities to reach objectives.
Disaster risks must be involved as public concerns in the weighing process of planning on all planning levels:

- Research: – Framework and indicators for risk assessment
- A definition of standards is needed.
- Assessment tools and standards have to be integrated in the planning process

- The ability of controlling the urbanisation process is a key competence to shape the future, that must be based on efficient disaster risk reduction by planning
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Thank you for your attention