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Towards Sustainable Water Environment and Stable Water Supply of Taipei Water System

Yang-Long Wu
Secretary General

Chinese Taiwan Water Works Association

Towards Sustainable water Environment and Stable Water Supply of Taipei Water System

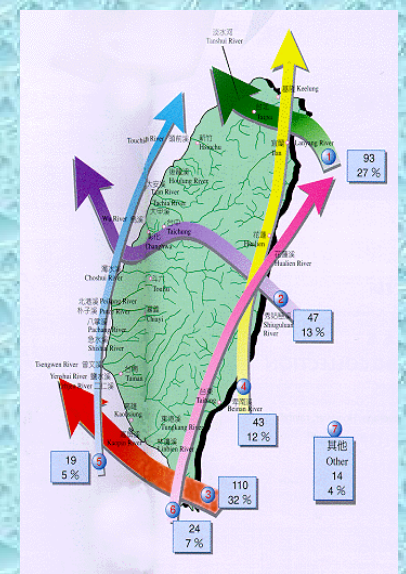
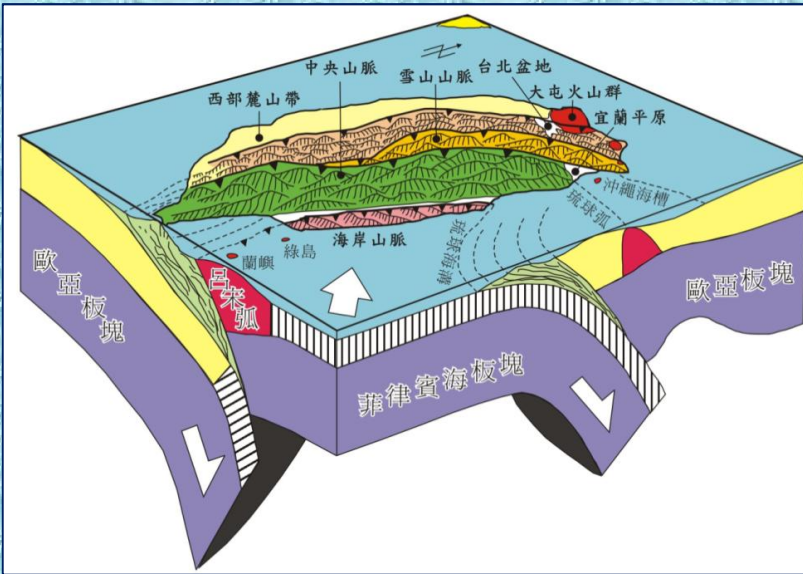
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- Stable and Safe Water Supply System
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Preface

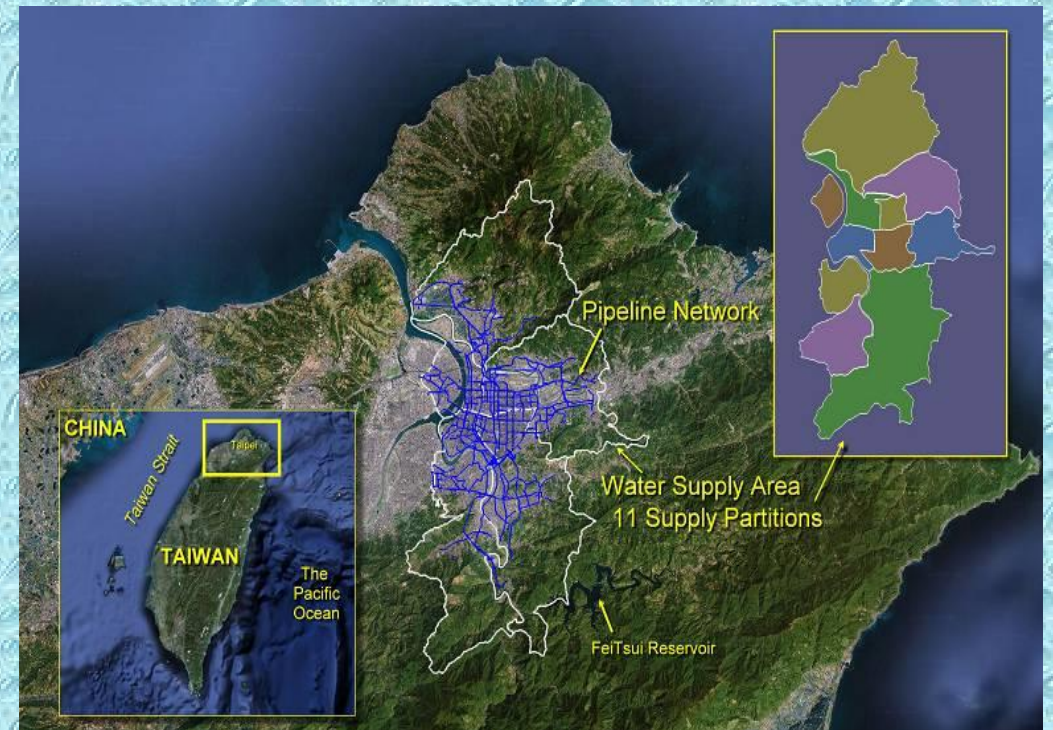
- Geographic Character of Taiwan

- Taiwan is located on the pacific seismic belt and the routes of typhoon. The disaster of water is occurred frequently.
- Due to the steep terrain and precipitation concentrates in rain-rich period. Only 19.5% of rainfall can be retained for use. Taiwan has 2.6 times of world average rainfall, the average disposable rainfall per capita is only 1/6 of the world average. Taiwan is the 18th of the most water shortage countries in the world.



Preface

- Profile of Taipei Water Supply System
 - The administration is Taipei Water Department (TWD)
 - Taipei water supply system is supplying about 2.4 millions CMD tap water to near 5 millions users in the Taipei metropolitan area.
 - The water mains are about 3650 Km and customer service pipes are about 2570 Km.
 - The tanks capacities is near 420 thousand tons and 58 boosting station around the supply area.



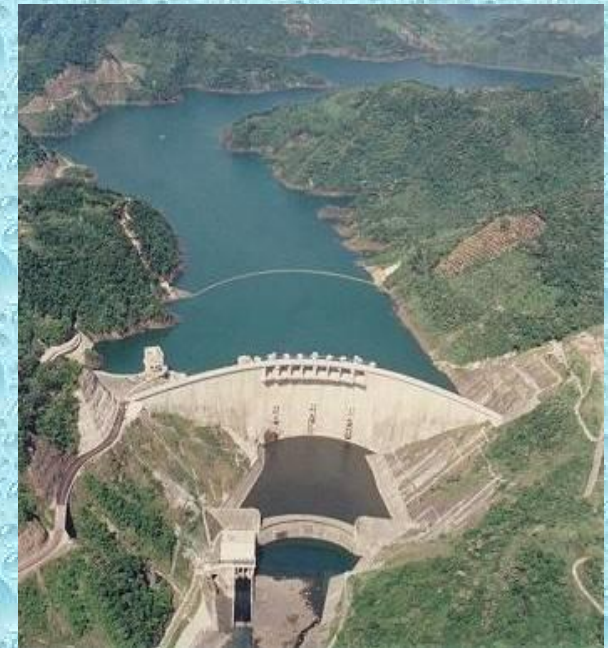
Sustainable Water Source and Conservation

- Taipei Water Source District
 - 97% water source of Taipei water supply system is come from Taipei water source district that is located in the southeastern of Taipei metropolis and coved 717 Km².
- Taipei Water Management Office
 - Taipei water management office is founded from 1984 and execute the management of sustainable water source, include management on land usage, forest management, water and soil conservation, water pollution prevention and cure, environmental maintenance and improvement, etc.



Sustainable Water Source and Conservation

- Taipei Feitsui Reservoir
 - Taipei Feitsui Reservoir is completed in 1987 and located in the Taipei water source district, the catchment area is 303 Km², the gross initial storage is 406 millions M³, nowadays, the effective storage is 335.5 millions M³.
 - Taipei water source is taking the water from nature flow in workaday and taking from Taipei Feitsui Reservoir as a water bank when natural flow is insufficiency.
 - Including Taipei Feitsui Reservoir operating Taipei water source is designed daily supply 3.45 millions M³ to meet the water demand of Taipei metropolitan area on goal year 2030.



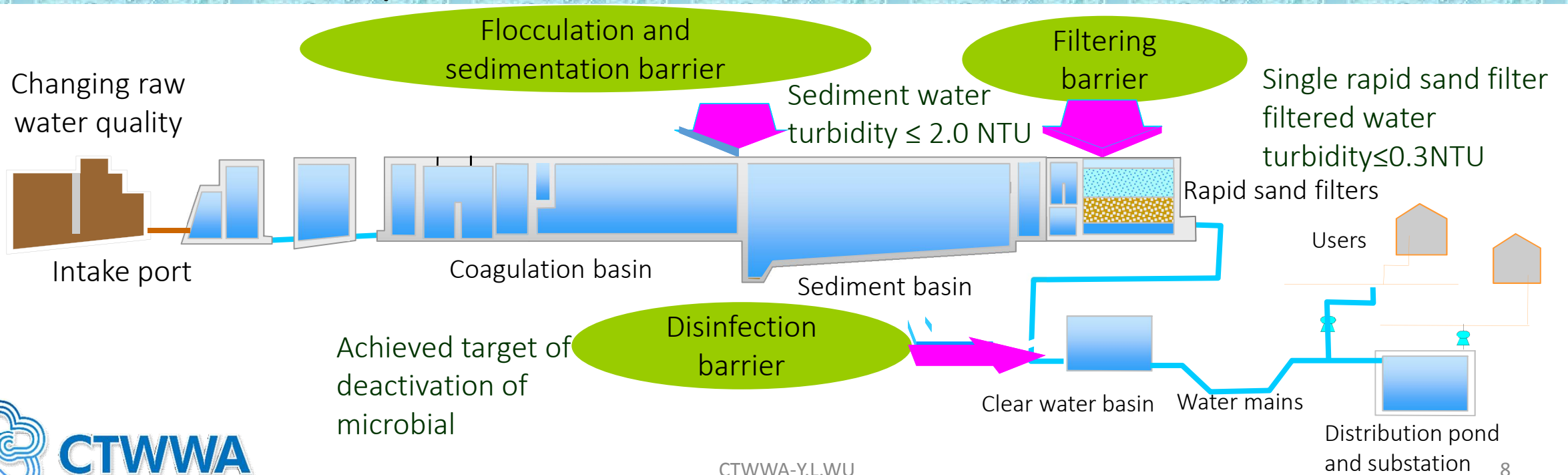
Water Purification and Water Quality Management

- Increasing Water Purification Capacity
 - Intensity of typhoon is along with heavy rainfall cause the high raw water turbidity that reduce the water purification capacity.
 - Building new water purification equipment and raising the exist equipment purification efficiency is necessary to meet the normal water demand.



Water Purification and Water Quality management

- Multiple barrier strategy in the purification process
 - In order to ensure safety of output water quality, each purification unit will still operate for the preset target that is stricter than the state “Drinking Water Quality standard”



Water Purification and Water Quality Management

- Recycling of Silt out of purification
 - Every water purification plant of Taipei Water Department are working with zero pollution emission equipment and the operation manner is in “upper clear liquid recovery” designed without discharge of waste water. In the meantime, the silt cake produced is recycled as raw material for brick and cement industries

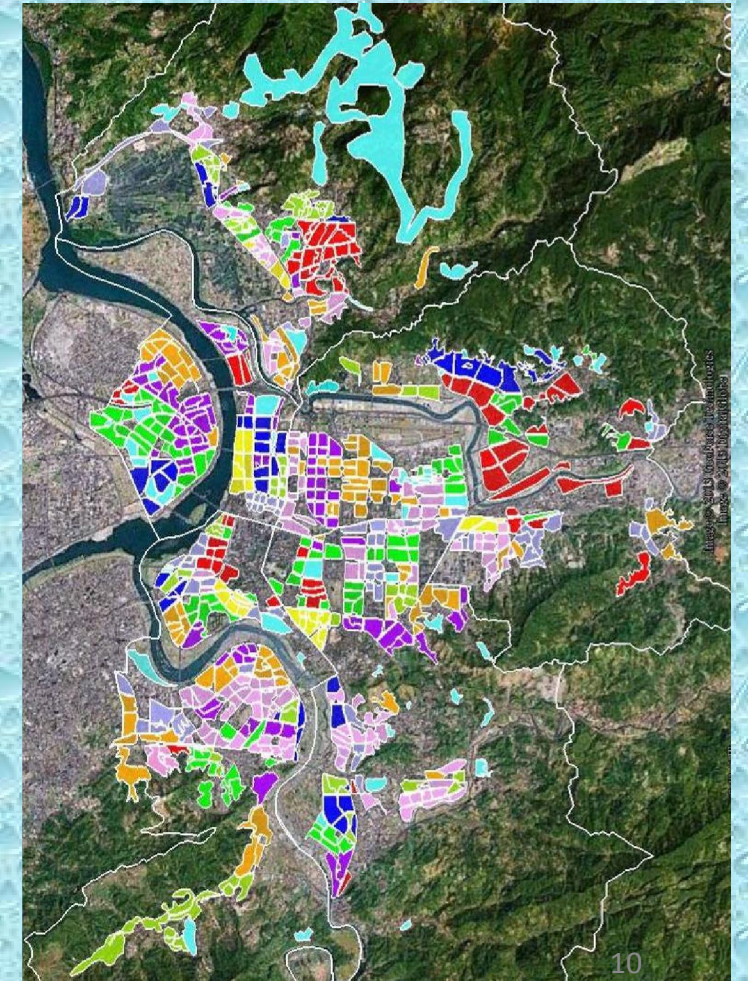


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Water Purification and Water Quality management

- On-line Water Quality Monitoring
 - In order to promote the confidence of the public over tap water supplied, uploading water quality monitoring information on line to allow the public to check the water quality close to home any time and also showing the water quality information on the MRT stations.



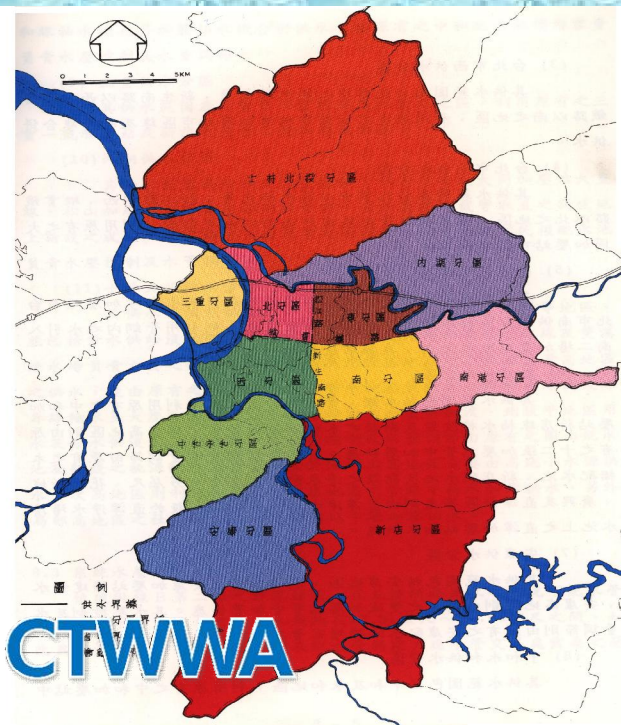
Water Purification and Water Quality Management

- Customer Water Quality Service
 - Establish the water quality management research and inspection techniques to meet with the needs and to be in line with the international standard and for issue of public concern, such as Cryptosporidium, DEPH, Microcystis ..etc
 - TWD provide free professional consulting for any questions asked and site survey services to help customers in solving water quality problems.



Stable and Safe Water Supply System

- 11 Water supply District and Dual Water Supply System
 - Taipei metropolitan area is separated into 11 water supply districts and each district has more 2 water supply resource with boosting station and water mains to meet the needs of service, maintenance and repair of hazard damage.



- The Challenges comes from Climate Change and Earthquake

Malfunction of Facilities

- Leakage of pipeline network
- Old facilities

Disasters

- Water pollution
- Rainfall uneven
- Drought
- Earthquake
- Typhoon

More Requirements

- Non-stop water supply
- Variation of water demand

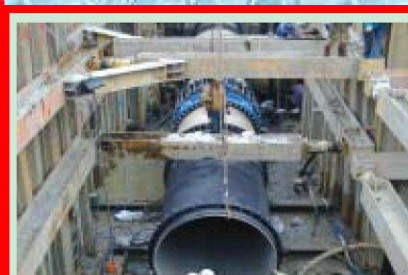
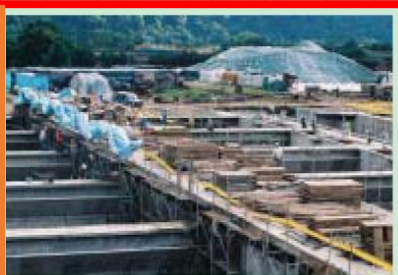
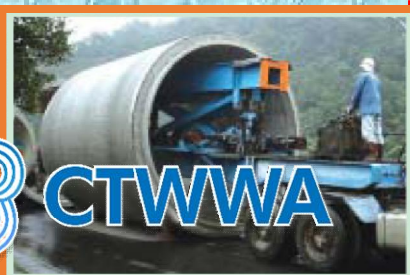


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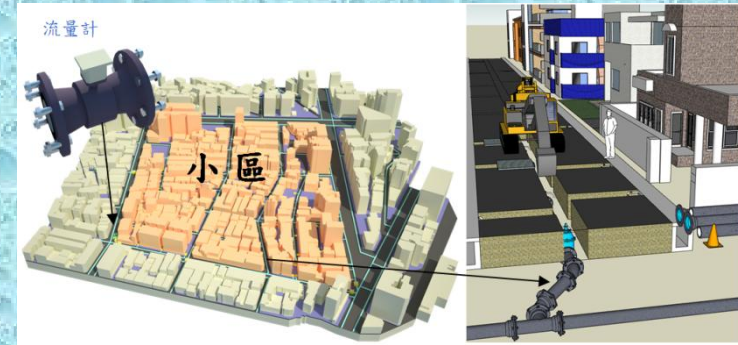
Stable and Safe Water Supply System

- Building Supporting and Back-up Mechanisms Plan
 - Period : 2006~2021
 - Budget : US\$700 millions
 - Outcomes and target
 - Established the second raw water trunk system that can be independent operation and comprised bilinear raw water extraction system.
 - Increased 1.4 millions water purification capacities and continue promoting the existed water purification plant to raise the backup ratio up to 56%.
 - Achieved double clean water transmission mains for more flexibility in water supply.
 - Enforced the structure of buildings and facilities to raise seismic resistance.
 - Building supporting mechanisms among water supply districts.



Stable and Safe Water Supply System

- Pipeline Network Improvement Plan
 - Period : 2006~2025
 - Budget : US\$ 70 millions
 - Outcomes and target
 - The target of the plan is decreasing the leak rate lower than 10% in 2025.(16.72% in 2014).
 - Replacing the aged water main pipes with Ductile Iron Pipe (DIP) and service pipe with Stainless Steel Pipe (SSP). The annual pipe replacement rate is about 2.62%.
 - DMA is applied in leak control and improvement with the Supply Pipeline Network GIS.
 - Renewing Water Pump Units and increase Frequency Converter Devices to accurately adjust and control the optimal water pressure in real time.



Environmental Education and Taipei Water Marketing

- Environmental Education Center
 - Established in 2011 and more than 26000 man-times to attend the water environment education activities (including thematic course and outdoor learning) every year.



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Environmental Education and Taipei Water Marketing

- Water Conservation Initiatives
 - The household conservation activities are carrying out through communities, households, schools and societies from 2007. The daily family water consumption is decreased from 263 lpcd in 2007 to 219 lpcd in 2014.



Environmental Education and Taipei Water Marketing

- Taipei Wonderful Water Marketing
 - Let people knowing Taipei water is wonderful but not easy to keep, using water in economizing than treasuring the water by marketing planning.
 - TWD launched Taipei Wonderful Water Services which consists of health check of water consumption equipment and water quality inspection services to assist consumers in improving and assuring water viability of consumption equipment and establishing autonomous maintenance and management system.



Conclusion

- Due to the climate changes and earthquake the conditions of water supply will be serious year by year.
- A sustainable water environment need the public and government endeavor together.
- Establishing stable and safe water supply system will spent much money and time and hard work to taking the water quantity and water quality meet the demand nowadays and future.
- Education and Marketing is useful for expostulating people using water in economizing and treasuring.

Thanks for your listening