

CURRENT STATUS AND DECENTRALIZED WASTEWATER TREATMENT IN HAI PHONG



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Urban - management areas

- 04 Urban districts, Vinh Bao, An Lao commune, Minh Duc - Thuy Nguyen town
- Area: 426,27 km² ;
- Population: 1.423.000 pp
- Hai Phong is 3rd largest city
- Port city and industrial city of the North
- Average precipitation - 1.650 mm- 1.800 mm (80-85% of total annual precipitation concentrate from May to October)



Haiphong Drainage and sewage current status



Drainage and sewage system :

- + Length 768 km sewage pipes and 25.000 manholes
- + Check valves : 165 check valves at the outlet to lakes, rivers

Haiphong Drainage and sewage current status

Drainage and sewage system :

- + Reservoirs: 72,4 ha
- + Channels: 243,6 km



Haiphong Drainage and sewage current status

Drainage and sewage system :

- + Pumping stations :2 trạm rainwater pumping stations and 22 wastewater pumping stations
- + Tidal prevention structures :19





Haiphong Drainage and sewage current status

History and conditions

- The major type is combined sewage system: domestic, industrial and rainwater. This system is built during the long period, un-confined, many parts are degraded.
- The system is built from the old times (150 years), un-confined, invested un-thoroughly
- The investment of urban wastewater system upto now is only account for 30-40% total urban areas (Hai An district 50% area is not covered by sewage system)
- The connection between citizens and the company is not frequent, the participation of community in the project implemented by the company is low.

External Drivers

- Rapid urbanization project, un-planned in constructions, and do not follow the order of investment.
- Many management unit such as City PMUs, local district, new towns are involved in wastewater: lack of expert in designing system, failure in connection with centralized system, low quality in construction.
 - During the construction period, many other infrastructures built to block the drainage system



Haiphong Drainage and sewage current status

Financial barriers

- City's budget is cannot cover the cost for sewage demand
- Not enough independence regarding financial issues. The financing approach is still controlled by the state.
- Limited budget, wastewater fee does not cover the operation costs.
- The wastewater fee is used for all wastewater and drainage (70% cost is for drainage operation) without additional support from city.
- Social participation in wastewater management facing difficulties because it does not generate profit for the investor

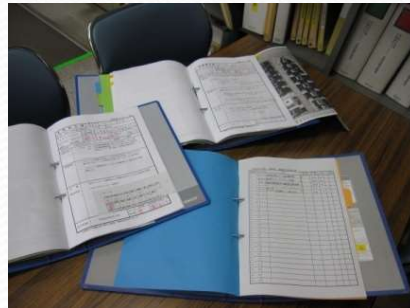
Actual demand

Additional about 100 km wastewater collection pipes

Leger: to manage wastewater and drainage system, operational and maintenance management



Leger



Check for equipment

Decentralized wastewater treatment

Barriers, difficulties

The wastewater characteristic is complicated, because

- Mixed with industrial wastewater



- Mixed with sea water, saline water



- The majority of wastewater is not collected to the treatment plant at Vinh Niem
- The wastewater influent to Vinh Niem plant is mixed with groundwater, because the collection treatment is aged, leaked and impact by rainwater. This make difficulties in operation.



Decentralized wastewater treatment

- Normally, wastewater from household and industry is primary treated using septic tanks, then collected to the sewage system and discharged directly to the environment, even without any treatment. This issue is happening frequently in the urban and rural areas. For many years, the sewage system is going through maintenance and upgrade, however does not meet the requirement.
- In many new towns, wastewater is separated from rain water, but because of unequally developed infrastructure and connection with the surrounding sewage system, ground level, connect to transportation infrastructure is limited. Therefore, the drainage efficiency is low, increasing of flooding and environment pollution in these urban areas.



Decentralized wastewater treatment

- **Technology:** Decentralized wastewater treatment focus on prevention rather than treat the problems. To make use of investment from the households. Enabling the use of low cost and simple technology.
- **Environment:** Wastewater flow into treatment facility is small, almost no breakdown, reduce the environmental risks. To make use of the ground level (flow with gravity) to reduce the operation cost,
- **Financial:** Low cost for building collection system, does not affect the existing infrastructure (roads, houses, buidings). Save the cost by investment in multiple stages, scale up according to the actual demand.
- **Decentralized wastewater treatment in modules:** Often to apply for shopping centers, production units, services.., with the total volumn of wastewater from 50m³/day to 200 m³/day. Depending on the actual conditions, the treatment plant usually built at inside the facilities or other area with easiness to transport to sewage system.



Decentralized wastewater treatment

- **Decentralized wastewater treatment in small areas:** Often apply in the boundary of industrial zones Nonura, Trang Due or residential area of Vinhomes, The Minato residence, Priksa Town HP... with the capacity of 200 m³/d to 1000 m³/d. Location of treatment plant has to be approved by the authority within the construction plan.
- The option for decentralized wastewater treatment need to follow the requirement: plant capacity, wastewater characteristic, pollutants, loading of the receiving bodies, location of discharged treated wastewater from the source. Treatment technology should meet the requirement of current standards for treated wastewater. To meet the requirement for technical, financial and operational condition, local weather, topology, soil and meteorology conditions. In addition, the technology can be scale up or replication, connect with centralized wastewater system in future and other related environmental conditions.

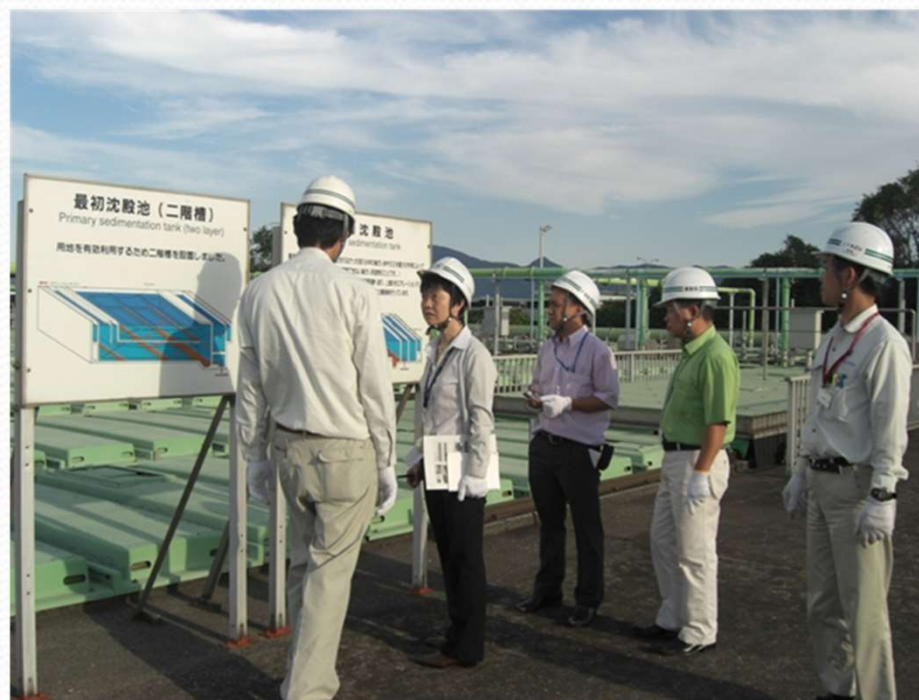


Decentralized wastewater treatment

- The technology for decentralized wastewater treatment included: septic tanks, UASB, BASTAF, Wetland, waste stabilization ponds, aeroten...
- There has been some good results at initial stage, but the application of decentralized system still facing challenges: choice of technology, quality of design and building, the process of approval, capacity for operation, monitoring and assessment, the participation of local communities.
- *One specific barrier is the Standard for Decentralized wastewater treatment has not been issued by MONRE for the Article 5- point 4 of the Decree 80/2014/ND-CP dated 6/8/2014.*



Decentralized wastewater treatment Capacity of Hai Phong Sewerage and Drainage One member Co.,Ltd



The staffs were trained in Japan, to work according to Japanese experiences in wastewater management.

The staffs visit Japanese wastewater works

Decentralized wastewater treatment Human capacity



Workshop, exchange on cultural and technical skills from Japan



Decentralized wastewater treatment Activities implementation

- DOC plan and request Haiphong wastewater and sewage company.
- Department of Finance to decide.
- Haiphong People's committee to approve the request and provide social services.
- Department of Planning, invest and decide the bidding.
- Budget planning.
- DOC to approve budget.
- Sign contract with Hai Phong Sewerage and Drainage One member Co.,ltd.
- Hai Phong Sewerage and Drainage One member Co.,ltd. assign to the responsible unit to implement activities
- Request payment and payment



Conclusion

- Environmental pollution, water pollution is getting more severe. Especially the lack of financial resources to build the centralized wastewater system, create advantage for decentralized system. In order to ensure the effective of the decentralized system, need to develop the policy frame work, standards/regulations, management regime and supportive policy.
- Center city with dense population, wastewater characteristic is complicated, need to build collecting sewer and connect to centralized wastewater treatment plant.
- Wastewater treatment need advanced technology and specialization.
- Therefore:
 - + Need of plant, equipment and technology transfer from the investor of Vinh Niem plant to **Hai Phong Sewerage and Drainage One member Co.,ltd.** as soon as possible
 - + Need continous technical support and international collaboration from the international organizations to the staffs, technical workers and specialists.
 - + The company should consider the above mission is the goal of the company, to concentrate all resources to fullfil these duties.

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Thank You.

