

Comprehensive Approaches to Develop and Maintain Drainage/Sewerage Systems in Urban Areas of Vietnam

Trinh Xuan Lai

Tqkhanh82004@yahoo.com

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Abstract

Vietnam, like many other developing countries in Asia, is facing the challenge of poor infrastructure system during its continuous reform process. Among urgent challenges originated from speedy urbanization, the issue of old, fragmented and deteriorated drainage/sewerage system in recent years has been posing urgent challenges to its governing authorities of different levels. Shortage of resources including funding and technology, weakness of institutional arrangement/management capacity and lacking public awareness are major causes. To overcome these shortcomings, there should be efforts of capital investment, institutional reform, management strengthening and community education/awareness techniques made to relevant stakeholders of all levels. They need to be integrated and activated at the same time by all stakeholders in order to obtain improvement of the existing drainage/sewerage systems, which will contribute to the nationwide target of poverty reduction and sustainable development.

1. Introduction covering location and problem definition

Vietnam is a tropical country in the Southeast of Asia. It has an area of 320,000 km² and a population of 83 millions. Over the last decade, the Government has been pursuing the Reform Policy resulted in significant changes of its socio-economic status. The country has 65 cities and provinces and they are classified in according to administration levels, which reflect differences in area, size of population, socio –economic condition and political status. There are five big cities are now under administrative function of the central government including Ha Noi, Hochiminh, Hai Phong, Hue, Da Nang, Can Tho. Provincial governments administrate the rest of provinces. In each province, there will be a provincial town and/or several district towns with different extent of socio-economic development.

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Looking back in to the reform process in the last 15 years, advancement of Viet Nam in socio-economic development is partly contributed by support and assistance of international donors such as World Bank, ADB, EU, Japan, etc. who had provided their official development assistance through a wide range of sector projects and programs with an aim to help the country to overcome poverty and achieve sustainable development. Among urgent issues of national agenda need to be solved, urban development is considered crucial to address rural-to-urban migration and the regional imbalance between the major cities and poor areas. External assistance to develop urban infrastructure systems of small and medium towns in Vietnam had given its emphasis on water supply rather than sanitation and drainage/wastewater management though there is a link between them. As a result of this, in recent years, when urban water supply has developed nearly to an extent of satisfaction, drainage/wastewater is posing urgent challenges to authorities of different levels when they are unable to accommodate the ongoing urbanization and economic development of urban areas. In provincial/district towns of Vietnam, the old, fragmented and deteriorated drainage/sewerage systems fail to be compatible with new and modern water supply systems. They trigger risks to environment and public health of urban communities, especially to the poor people. Shortage of resources including funding, technology, institutional arrangement/management capacity and public education/awareness are major causes for poor and insufficient drainage/sewerage systems in provincial/district towns.

In response to the Call for Papers of the Asian Development Bank, the Author, who has more than 30 years involved in water sector of Viet Nam as the water supply, drainage/sewerage engineer, would like to present in this Paper some individual views and proposals as comprehensive approaches to develop and maintain drainage/sewerage systems in urban areas of Vietnam. The scope of proposed ideas presented in this paper is applicable to urban areas but limited to small and medium towns¹.

2. Situation Analysis

Urban areas in Vietnam are classified based on administrative management category. Accordingly, there are 5 central cities and 60 provinces. In each province there are one provincial towns/city and/or other district towns serving as economic and administrative centers for the surrounding areas. Population sizes of urban areas are therefore different to each other, ranging from 20,000 to 500,000 at provincial level and to millions at central level.

According to Statistic Book of Year 2003, depending on different level of urban areas and socio economic development, urban water supply coverage varies from 60-95%, access to piped water ranges from 60% to 90%, septic tank coverage is 55% - 70%, solid waste is collected from 65%-80% of households, and drainage coverage is 7-89m/ha. These statistic figures may be lower in district towns where economic development growth rate is rather low.

¹ Small and medium scaled towns in this Paper refer to towns of provincial and district levels which are classified on the basis of administrative management level.

In general, drainage/sewerage and sanitation facilities in provincial/district towns of urban areas exist in the form of combined system, which conveys both storm water and wastewater. They are open canals and box culverts, which are out of date, poor designed, fragmented and deteriorated due to lack of proper investment and maintenance. There are few separate sewerage systems developed recently for new towns or cities but small in scale and limited in hydraulic capacity to serve for particular purpose of economic or industrial activities. As a result of this, residents of provincial/district towns are facing environmental and public health problems resulted in disturbance to their economic and social activities especially those urban poor people living in less developed areas.

The National Orientation for Urban Drainage and Sewerage Development to 2020 interprets the Government's strategies to pursue ongoing improvement, extension of the existing combined drainage system; providing new water chamber and interceptor sewers to separate storm water and waste water; developing separate waste water system including sewers and waste water treatment facilities in industrial areas, newly developed city or urban areas and tourism complex. Also, the Construction Law requires septic tanks provided to all of newly building structures.

3. Description of problem

As mentioned above, provincial/district towns are serving as economic and administrative centers for the surrounding rural areas. They provide most of the non-agriculture employment in their provinces. In provincial/district towns, most of drainage/sewerage systems are in a very poor condition since they were constructed long time ago. They are unable to meet the increasing demand for urban services because of lack of investment, inadequate maintenance and weak institutional capacity. As a result of this, flooding and environmental risks trigger health problems to the urban residents, especially to poor people who usually reside in less developed areas where drainage system is limited or overloaded. The problem is also compounded by overflowing of river during rainy season, causing serious disturbance to those communities living near the river's bank. Flooding of houses, roads, footpaths and public areas such as the town's school, market; bus station causes property damage and disrupts economic and social activities. Frequent overflows of polluted storm water mixed with wastewater pose health risks to communities. Water born diseases occur with high frequency and in large areas. Pools of stagnant water resulting from intense rainfall during the rainy season, and stagnant wastewater in open canals and drains during dry season provide breeding grounds for mosquitoes and other disease bearing insect vectors.

It is hard to find a significant modern wastewater treatment system in provincial/district towns rather than septic tanks. Septic tank coverage is rather low in small, poor and less developed towns. Most of industrial facilities, hospitals or health clinics do not have adequate waste water treatment or if so they are not functioned well enough to ensure no harmful waste water discharged to combined drains or sewers. Although septic tanks are the most common facilities of wastewater treatment for urban activities, there has been a lack of maintaining actions taken to ensure its designed treatment capacity. Therefore, problem of undersized and lack of frequently emptied septic tanks add to the causes of environmental problems. The consequence is solids spill over into drains causing blockages and environmental degradation and liquid effluent seeps into the soil, polluting near-surface aquifers. The lack of proper septic tanks constitutes a major

health hazard during storms and flooding when fecal pollutants from human wastes are easily spread through contaminated floodwaters, covering public areas such as roads and footpaths and the ground floors of homes and other buildings. The lack of adequate on-site sanitation systems results in contaminated surface waters and related health risks. They are generally in need of improvement and greater coverage of septic tanks in the communities is necessary to reduce adverse environmental impacts and health risks.

Health and environmental problems in the towns become serious because uncollected household garbage is dumped into drains, waterways, beaches or vacant land, resulting in pollution, odors and drain blockages which exacerbate flooding. Disposal of solid waste to drains also increases maintenance costs. The reason is because existing solid waste management is inadequate due to limited collection and transport systems and leads to illegal disposal of solid waste to drains, waterways. Also, unsanitary landfills with poor design or simple leachate treatment discharge polluted and untreated leachate to nearby water course pose a great threat to the surrounding residential areas.

Together with the whole poor background of existing drainage/sewerage system, once again, institutional or management constrains are also hindering elements posing to local urban public authorities which require urgent and radical initiatives of reform. Public entity known as Urban Environmental Company (URENCO) or Urban Public Works Unit (UPWU) is responsible for managing, operating and maintaining urban public facilities including water supply, drainage, wastewater solid waste and other public services. It is an operating unit attached to the provincial/district people's committees (PPC/DPC) but it has little managerial autonomy, and very limited responsibility or accountability for budgeting or meeting service standards. They do not operate as a self-financing public service enterprise, but relies largely on budget allocations from the PPC/DPC for its operating budget and capital investment. Cost recovery from their urban services is very low. Although the URENCO/UPWU bills customers and collects revenue for water supply, tariffs are set by the PPC/DPC at levels that are insufficient for proper O&M and do not provide sufficient funds for capital investment. Actually the URENCO/UPWU undertakes little or no maintenance of these systems because of lack of fund for their technical and labor inputs. There is a fact that only some provincial towns charge wastewater or drainage tariff through the water bill. Other smaller authorities of district towns may not make it effective. They rely entirely on budget allocations from the PPC/DPC for these services and thus cost recovery is ignorant. For solid waste management, URENCO/UPWU provides a basic service for collection and disposal, which serves from 20% to 65% of households. Although households are charged for the solid waste service, bills are issued by another authority known as Tax Department belong to PPC and through this billing channel, revenues are transferred directly to the treasury rather than to URENCO/UPWU. In any case, the level of tariffs is too low to cover proper operation and maintenance costs.

Sanitation and environmental problems at the community and household level are severe. However, there is little opportunity for participation by the communities to make decisions on their development priorities and to participate in planning, implementation and maintenance of local infrastructure. There is generally a low understanding of environmental health issues at all levels from residents to town agencies and leaders. The community has low awareness of the links between water, sanitation, hygiene and health, and basic hygiene practices in the communities are poor. It is due to lack of awareness activities and printed health information material relating to water and sanitation for households. There is a need to increase community participation in

improving sanitation and environmental conditions and to raise people's awareness of health sanitation issues

4. Preliminary Approaches

Taking into account National Orientation for Urban Drainage and Sewerage Development to 2020, it is urgent to take necessary and appropriate measures to improve existing drainage/sewerage/sanitation systems, which will help to bring benefit of improving living conditions to people living in urban areas. The improvement of drainage and sewerage systems will contribute to poverty reduction, economic and social development, improved public health, and will have an overall positive social impact. The following suggestion may be useful to undertake in the developing background of Vietnam, which are now facing many constraints of resources and policies.

First and foremost is to seek for available funding from both internal and external sources to invest in development of new urban infrastructure system and improving existing system to serve the increasing demand on water supply, drainage, sewerage and sanitation of urban residents. The Government should take this into consideration of its annual budgeting plans, setting a certain part of allocated fund available to provincial governments for developing urban infrastructure system. A part from that, at central level, policy reform to harmonize ODA procedures may build up more confidence of donors to our demanding environment of development and thus help Vietnam to absorb further official assistance for urban development strategies.

Efforts of institutional reform should be made to relevant authorities of all level, i.e. URENCOs/UPWUs who are now designated to take over maintenance and management of drainage/sewerage systems. The reforms will help to ensure their efficient capacity in handling urban services. The institutional reforms will cover various changes to enable URENCO/UPWC (i) to become efficient and autonomous public entities with focus on management, operation and maintenance of urban services including operation and maintenance responsibilities to urban public facilities; (ii) to suggest, justify, and charge appropriate² service fees to their customers to ensure that fees cover at least operation, maintenance and equipment replacement costs in the short term and an increasing portion of capital investment costs in the medium term; (ii) to own equipment for O&M and keep in their accounts sufficient funds for the provision of depreciation of the equipment (iii) to impose penalties to people not paying the fees for the services received, or destroying urban infrastructure under their responsibility; (iv) to recommend service levels after consultation with customers; and (v) to make key management and operating decisions. These institutional arrangements recommended to URENCOs/UPWCs should be made through intensive training including on-the-job and formal training to their staff in urban services management, financial management, asset management, and customer relations. Besides, capacity strengthening to other relevant authorities at provincial and town levels³ should be also made though training to improve their capacity on urban services management and urban planning, enable them

² Tariff for drainage and wastewater services should be charged on a "user pays" basis that takes into account the special needs of poor households and their capacity to pay.

³ Relevant authorities at provincial and town levels involved in urban works are construction departments under provincial people's committees or urban management division under district/town people's committees.

to develop appropriate service levels for urban services in consultation with residents and businesses.

Initiatives of technology and technical options should be encouraged but they need to be in line both with the approved provincial master plans and the Orientation Plan for Urban Drainage and Environmental Sanitation to 2020 issued by the Government. These alignments can be interpreted as the followings:

- Design of drains, sewers and wastewater treatment works will follow the objectives and targets of Government's Orientation Plan for Urban Drainage to 2020, and Vietnamese technical standards which identify appropriate technology and design for existing and future development of urban infrastructure system.
- For existing developed areas in the provincial towns, a combined drainage system is proposed for improvement of which existing primary drains and open canals will be upgraded to convey storm water to discharge points at rivers, existing secondary drains will be rehabilitated and cleaned; extension network of primary, secondary and tertiary drains; rehabilitation and deepening existing regulation ponds to improve surface drainage capacity.
- For sewerage and sanitation, it is proposed that overflow chambers should be constructed at discharge points to convey wastewater through interceptor sewers to a future wastewater treatment facility and in the medium term, technology proposed for this work will be biological or oxidation ponds.
- For newly developed, tourism and industrial area, separate drainage and sewerage systems are proposed for conveying stormwater and wastewater; wastewater treatment facility in the medium term will be biological or oxidation ponds.

Finally, together with physical improvement, it is crucial to develop a scheme of community participation and education/information/public relation to link the responsibility of developing, protecting and maintaining urban infrastructure systems of concerned authorities with urban residents. Specifically, the education/information/public scheme aims to improve the communities' awareness of the relationships between water, sanitation, and health and the necessity of developing a good drainage/sewerage/sanitations system. Community will be able to participate in planning, operation and maintenance of urban facilities through various programs initiated and managed by local women's unions. They may appear in the form of community based sanitation program and sanitation credit program or revolving funds. A certain amount of fund will be sought and provided by provincial/district towns governments to local women's unions to provide seed funds to assist people living in narrow alleys and streets to construct tertiary drains connecting to larger drains. They may be encouraged to operate and maintain the drains by entering into service contracts with URENCOs/UPWCs. The septic tanks revolving funds can also provide some financial assistance to poor households to construct septic tanks or sanitary latrines. These activities usually conducted by local Women's Unions, which have proven it success, and efficiency under ADB funded provincial water supply projects. Women unions also need to be trained to carry out awareness campaigns to enhance awareness of the benefits of improved infrastructure, O&M requirements and the communities' responsibilities for the protection of public assets.

A. References

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B. Supporting Information

1. Vietnam Statistic Book 2003