

Cooperation Fund for the Water Sector Pilot Demonstration Activity

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| Activity Title: Developing Appropriate Sanitation Solutions for Peri-Urban areas in Viet Nam | |
| Proposer (Name, Div/Dept): Le Van Duc, Deputy Director, Transport and Urban Public Works Service, Hanoi People's Committee | |
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| Country (DMC): Viet Nam | Region: Southeast Asia |
| Activity Proposed Start Date: July 2007 | Activity Proposed Duration: 9 months |
| Cost Estimate: 50,000 US\$ | |
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1. Background and Rationale:

This Pilot and Demonstration Activity is proposed to be implemented in Kieu Ky, a peri-urban commune of Hanoi Municipality. The sanitation's situation in this commune is representative of many other crafts villages and communes of Northern Viet Nam. In particular, Kieu Ky faces severe pollution problems, due to human and crafts activities. In addition, the commune has no access to a central water supply system and relies on self supply combined with a very low level of sanitation. A water supply project is being considered for the commune of Kieu Ky, to be financed under the decentralized cooperation between the Region Ile de France, France and the Hanoi People's Committee, and will provide the commune with a connection to the Hanoi central water supply network.

This proposed PDA will focus on sanitation issues, which are expected to worsen upon the implementation of the water supply project. The objective is to develop a sanitation model for peri-urban areas of Viet Nam, applicable to other part of Southeast Asia based on a evaluation of combined research and surveys with the implementation of one package treatment plant, through a bottom-up approach in Kieu Ky commune.

2. Objectives:

This proposed Pilot and Demonstration Activity aims at:

- selecting appropriate domestic wastewater collection and treatment systems,
- selecting appropriate wastewater collection and treatment systems for crafts workshops,
- implementing a pilot package wastewater treatment plant.

3. Location and context of Work:

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Kieu Ky is a commune of over 10,000 inhabitants, divided into 2,000 households distributed in 9 villages. It is located 18 km from Hanoi City Center, in Gia Lam district within the boundary of Hanoi Municipality.

Kieu Ky has still a strong rural tradition, with 42.2% of households cultivating paddy fields. The crafts activities are also very developed (41.9% of households):

- production (beating) of gold leaves for religious ornamentation,
- bags manufacturing (cutting, assembling, painting),
- cardboard recycling,
- plastic components manufacturing,
- metal components manufacturing.

All households rely on self supply by private wells accessing underground water at 40 meters deep, but will be connected to the central water supply system as part of another project before the end of the year 2007.

Most households use latrines. 55% of households have septic tanks, collecting black wastewater and 40% have double vault latrines. No household collects gray wastewater, which is directly discharged into the environment.

4. Description of Activities

Proposed activities will focus on two main issues.

A. Domestic wastewater

The current decentralized approach through on-site sanitation (latrines and septic tanks) has to be improved and upscaled. Small reticulation network combined with decentralized wastewater disposal using communal and localized package treatment plant are suitable for individual on-site system serving one household to shared facilities, which size will depend on population density and topography (usually from 5 up to 1,000 households). The proposed activities, related to domestic wastewater, will (i) assess sanitation options; (ii) select the optimum sanitation approach; and, (iii) consist in:

- Investigating current wastewater disposal practices among the population to determine the types and distribution of sanitation facilities, as well as the possibility for evolution in the short and medium term;
- Completing socio-economic surveys on the commune inhabitants on their willingness and ability to pay for sanitation services;
- Assessing decentralized wastewater treatment systems that can collect and treat not only black water, but also gray water. In particular, finalizing a market research on systems equipped with integrated pre-treatment systems (such as grid filtration, oil removal, ...), which may be available in Viet Nam;
- Carrying out surveys on local market availability of specialized trade skills, such as masons, plumbers, contractors, suppliers, ... that could work in the sanitation sector (for example, improving existing septic tanks, latrines, ...);
- Carrying out market research for sludge removal and disposal by tankers, ...;
- Reviewing geotechnical analysis available to assess the potential for on-site disposal of effluent;
- Defining a suitable location, selecting and installing a locally available packaged wastewater treatment plant.
- Proposing a financing mechanism for the capital investment and the operation and maintenance costs as well as institutional arrangements for operation and maintenance of the facility

B. Crafts' industrial wastewater

Crafts activities are responsible for major pollution, mostly due to industrial wastewater discharged into the environment without any treatment. One of the major health concern is the discharge of untreated wastewater from the crafts' activities into irrigation canals and paddy fields, causing acute skin rashes to farmers. Furthermore, infiltration of untreated industrial wastewater is threatening the quality of underground water resources, used by the majority of peri-urban households in Viet Nam for water supply in the absence of a central water distribution network.

The long term (2015) solution proposed by the Municipality is to relocate the most polluting crafts activities into one specific crafts industrial zone with proper centralized water supply and sanitation facilities. Until such time, simple appropriate technologies could be implemented for each category of polluting craft workshop. The proposed activities related to crafts' industrial wastewater consist in:

- Completing socio-economic surveys among the craftsmen on their willingness and ability to pay for specific sanitation service;
- Drafting a precise mapping of workshops in the Kieu Ky commune;
- Performing a chemical analysis of the effluent from the craft workshops to assess the composition of wastewater and determine the nature of each type of pollution;
- Selecting the appropriate technology required to treat each type of crafts wastewater.
- Proposing a financing mechanism for the capital investment and the operation and maintenance in line with the socio-economic surveys as well as institutional options for the operation and maintenance of the treatment plant.

5. Implementation Schedule, Institutional Management Arrangements, and Stakeholders Participation:

A. Implementation Schedule

The implementation of the PDA is expected to be completed within 9 months, from July 2007 to March 2008. This nine month period includes a 4 month period corresponding to the local approval for the treatment plant and 3 months construction, installation and commissioning. The two key tasks described hereabove will be launched and carried out simultaneously.

B. Institutional Management Arrangements

Region Ile de France, France and Hanoi People's Committee signed a cooperation agreement in 2000. In 2006, Kieu Ky was selected by both sides as the next beneficiary of the cooperation program. The French NGO EAST Vietnam was selected to define a program for water supply and sanitation, including solid waste in Kieu Ky. The pre-feasibility report was used as a basis to define the water supply component and this PDA for sanitation with ADB.

In Hanoi Municipality, the Transport and Urban Public Works Service (TUPWS), Hanoi People's Committee, is responsible for water supply and sanitation issues. An agreement between TUPWS, representing the Hanoi People's Committee, and EAST Vietnam, representing the Region Ile de France, will enable the implementation of all activities listed above.

Close cooperation between Gia Lam People's Committee (district level), Kieu Ky People's Committee (commune level), and EAST Vietnam will also be set up to implement activities.

A pilot wastewater treatment plant available locally and cofinanced by the Municipality or by a bilateral donor will be included in the project. The selection of the treatment plant will be between ADB and TUPWS based on the recommendations from EAST.

C. Stakeholders Participation

Different stakeholders will take part in the implementation of the activities described above:

- The **NGO EAST Vietnam**: as the implementing organization, EAST Vietnam will launch, implement, and monitor all the activities;
- The **TUPWS** will facilitate the implementation of activities and monitor the project;
- Local water resources **experts** and technicians will be consulted and involved in technical studies, as well as experts of crafts villages' pollution.
- **Local mediators** and **mass organizations** (Women Union, Youth Union...) will actively participate to socio-economic surveys and market researches. They will also advocate among inhabitants for best sanitation practices and start IEC (Information Education Communication) activities, essential to ensure people's participation.

6. Expected Results (outputs/outcomes/effects/impacts):

The proposed PDA will **enable choices of appropriate technologies** both for domestic and crafts wastewater disposal. This PDA is a preliminary step to a wide sanitation program, which will be implemented soon afterwards in Kieu Ky, following recommended solutions.

Moreover, social studies, market researches and first IEC activities carried out by local mediators ought to prepare the community to a water and sanitation program, and **ensure their future involvement**. Indeed, the risk incurred with innovative technical projects based on very specialized actions, could be that people would not feel concerned. Advocacy and involvement of local mediators are expected to ensure that the population will take up the future proposals.

In Hanoi, specialized researchers from technological institutes and research departments have been working on sanitation solutions for crafts village for several years. However, their skills and knowledge suffer from competition with international experts. So, one important impact of this global study is to **enable local skills to be widely involved and thus valorized** among authorities.

7. Scope for Replication/Use in Other DMCs:

Above all, Kieu Ky must be considered as a crafts village set in Hanoi's peri-urban area. Kieu Ky's case is representative of many other crafts villages in Red River Delta and in Viet Nam. The number of crafts villages in the Delta has doubled in the last 20 years: from 500 to 1,000 today, representing 40% of crafts villages in Viet Nam. Most of these villages have the same characteristics as Kieu Ky: strong rural traditions, developing crafts activities, severe pollution problems and rapid urbanization.

Kieu Ky can thus be considered as the recipient of a pilot and innovative program, whose approaches and methodologies are highly replicable in other crafts villages.

Furthermore, some issues highlighted by the PDA could be applied to non crafts villages. Indeed, the solutions for decentralized wastewater treatment could be replicated in many peri-urban areas of Viet Nam and China as well as Southeast Asia.

The lessons learned from the PDA will be applied into the Thanh Hoa City Socio-Economic Development Project, a model of Urban Development Project, which will address peri-urban water and sanitation issues.

8. Cost Estimate:

| Cost estimate | TOTAL |
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| A. Domestic wastewater | |
| Socio-economic surveys among inhabitants on their willingness and ability to pay for sanitation service (10 weeks) | \$2,500 |
| Surveys on decentralized wastewater treatment systems (5 weeks) | \$1,500 |
| Surveys on local trades skills (10 weeks) | \$2,500 |
| Market research on sludge removal options (5 weeks) | \$1,500 |
| Soil samples and properties analyses (2 weeks) | \$2,500 |
| Supply and Install package wastewater treatment plant (including 50% cofinancing) | \$10,000 |
| | \$20,500 |
| B. Industrial crafts wastewater | |
| Socio-economic surveys among crafts workers on their willingness and ability to pay for specific sanitation service (10 weeks); | \$2,500 |
| Chemical analysis of workshops effluents (2 weeks) | \$2,000 |
| Mapping of the craft workshops and survey to define appropriate technology required to treat crafts wastewater (10 weeks) | \$7,500 |
| | \$12,000 |
| C. Project Management | |
| Per diem (100 days @\$100 per day) | \$10 000 |
| Report on Domestic Wastewater, including treatment plant selection | 5,000 |
| Report on Industrial Craft Wastewater | 2,500 |
| | \$17,500 |
| TOTAL | \$50,000 |