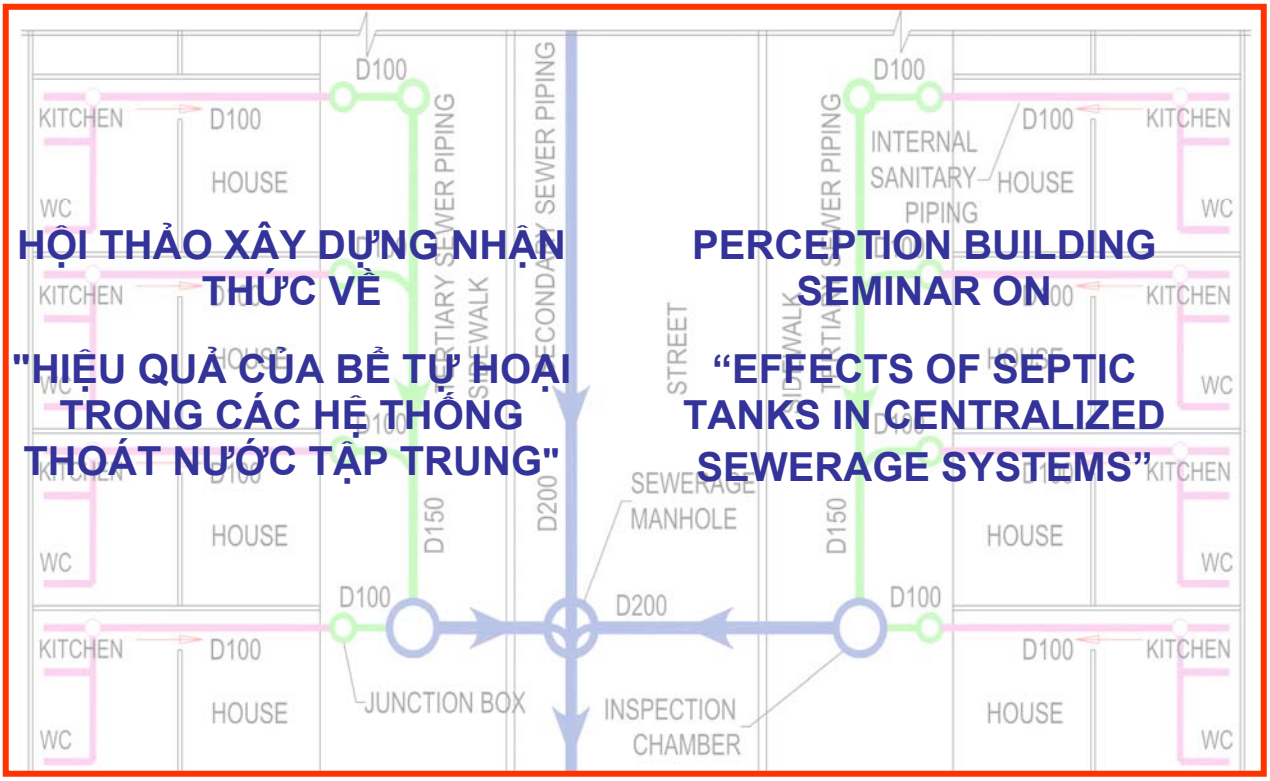
Ministry of Construction

COOPERATION
FEDERAL REPUBLIC OF GERMANY
SOCIALIST REPUBLIC OF VIETNAM

gtz



HỘI THẢO XÂY DỰNG NHẬN THỨC VỀ "HIỆU QUẢ CỦA BỂ TỰ HOẠI TRONG CÁC HỆ THỐNG THOÁT NƯỚC TẬP TRUNG"

PERCEPTION BUILDING SEMINAR ON "EFFECTS OF SEPTIC TANKS IN CENTRALIZED SEWERAGE SYSTEMS"

- DOCUMENTATION OF PROCEEDS -

(English Version)

Horison Hotel Hanoi - November 03, 2006

MINISTRY OF CONSTRUCTION
PERCEPTION BUILDING SEMINAR ON
"EFFECTS OF SEPTIC TANKS IN CENTRALIZED SEWERAGE SYSTEMS"

- DOCUMENTATION OF PROCEEDS -

Content:

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List of Abbreviations:

- MoC: Ministry of Construction
- MoF: Ministry of Finance
- GTZ: Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
- HH: Household
- IEC: Information and Education Campaign
- PC: People's Committee (provincial or municipal)
- ST: Septic Tank
- WB: World Bank
- WW: Wastewater
- WWTP: Wastewater Treatment Plant

Summary of Results of the Seminar

The perception building seminar on "EFFECTS OF SEPTIC TANKS IN CENTRALIZED SEWERAGE SYSTEMS" was carried out on Nov. 03, 2006 in the Horison Hotel Hanoi with 54 participants (see attached attendants list).

The following presentations were made (for details see attachments):

A. Justification of Septic Tanks in Centralized Wastewater Systems – Prof. Preussner - GTZ
B. Urban Sanitation in the Asian Context – Gerry McManus – B&V
C. Connecting Households to a Separate Sewerage System – John Rockhold – Carl Bro
D. The Dam Tao Experience – Lutz Meier – Borda
E. Septic Tanks and Connections – Mr. Cong Thanh – WB
F. Concept of On-site and Off-site Treatment Systems in Japan – Mr. Kitagawa – JBIC

The presentations were followed by a brainstorming session and discussions on the pros and cons of septic tanks within urban areas, focusing on: 'prevailing constraints', 'technical options' and 'economic & institutional aspects'. The following chapter is representing the outputs of the attached 'brainstorming' matrix and 'results' matrix.

1. Prevailing Constraints

The identified 'constraints' comprise 'technical', 'financial', and other 'non-technical' issues.

1.1 Technical Issues:

a) Current septic tanks do not follow particular 'building codes' and cannot be considered as efficient pretreatment units. Constraints: Insufficient local regulations, missing binding building codes and construction supervision, limited availability of space in the yards of most of the private houses.

b) Inadequate maintenance of domestic septic tanks, often neglected or not emptied at all. Constraints: Limited awareness, missing supervision and inventory by the municipal public works company. Often, septic tanks cannot be accessed at all.

Inadequate and insufficient maintenance of septic tanks may affect the efficiency of the treatment process of centralized waste water treatment plants, the lifetime of the drainage system (pre-dominantly concrete pipes), and may pollute the groundwater because of leakages. Moreover, odors in the house and/or the streets affects public convenience.

c) Connection of existing septic tanks to centralized sewage system may be difficult, depending on local circumstances. Constraints: The location of the septic tank within the house and the location of the septic tank outlet within the HH property.

1.2 Financial Issues:

a) The 'ability to pay' for O&M cost of centralized sewerage was perceived by the participants contradictorily, where as some say it is 'not affordable', the WB says, in line with their research, that the HH's ability to pay is 'high'.

b) However, there is consensus, that the HHs' 'willingness to pay' for the O&M cost of sanitary infrastructure is low. Constraints: Lacking awareness and the general assumption that wastewater services are 'public' and therefore free of charge.

c) PCs' perception on 'sustainable' wastewater management seems to be insufficient. Diverse priorities in infrastructure investment might not favor waste water related

projects and operations; PC are reluctant to make the 'polluters' pay. Constraints are related to insufficient national regulations, poor 'law enforcement', limited environmental awareness and sector related knowledge.

d) The limited waste water related ODA funds are on-granted by the MOF to the provincial/municipal levels, in line with Decree 108/2003 (exception: WB loan for HCMC), treating relatively 'rich' local governments equally to relatively 'poor' local governments.

e) Access to micro-credits is seen as a constraint in the event that HH are obliged to connect separately to a centralized waste water collection and treatment scheme.

1.3 Awareness and Regulations:

a) Limited stakeholders' awareness and lack of knowledge result in inadequate wastewater disposal practices. Limited 'political will' leads to certain reluctance of enacting prevailing legislation consistently, despite obvious and visible negative environmental impacts.

b) Lack of inspections and penalties for discharging WW uncontrolled and without permission; supervisory functions mostly inferior at provincial levels.

2. Technical Options

The guiding argument that was forwarded reads: 'do not build what cannot be maintained', which, in consequence, makes it necessary to conduct a comprehensive analysis of the local regulatory and institutional framework, as well as social and economic conditions within the project area during the feasibility stage.

There is an obvious need to assess technical options on a broader scale within the framework of 'sewerage and drainage master plans' or 'sanitary mapping' procedures for towns and cities, including the identification of appropriate technical options, among others (i) centralized sewerage - e.g. central business district, (ii) semi-centralized sewerage – e.g. units for 10,000 to 20,000 HH, preferably in areas where re-use of wastewater is considered as an option, and (iii) decentralized sanitation – e.g. peri-urban areas in the form of individual septic tanks or 'communal' septic tanks.

Hence, design criteria need to be developed assuring the appropriate selection of technical waste water collection and treatment options, considering the present and future degree of urbanization, population density, geographic and socio-economic parameter, etc. The identification and application of 'least cost' solutions should become a compulsory 'selection criteria' of any investment project.

Guidelines for the selection of:
'off-site' vs 'on-site'
and
'combined' vs 'separate'

The Japanese JOUKASOU system is a 'high' tech decentralized waste water treatment unit for domestic grey and black water, providing high efficiency for areas that are economically unsuitable for centralized sewerage.

New urban residential areas should provide for centralized separated waste water collection/treatment and drainage systems, not requiring the construction of individual septic tanks.

An 'incremental' development approach is required, utilizing limited available resources for satisfying the most urgent needs; as more future resources are made available, the 'sophistication' of the systems can be improved.

Because of time limitations the seminar could not conclude on firm technical recommendations for the transformation process from 'on-site" base sanitation to 'off-site' sewerage; apparently, experience is not sufficiently available on that subject.

However, the argument was made to abandon septic tanks in the event that a centralized wastewater collection and treatment system is provided. In addition, a clear definition of the connection point to the private property needs to be established.

Apparently the decision on the use of septic tanks within a centralized sewerage system needs to be analyzed case by case, taking into account the conditions of 'tertiary drains/collectors' and the reliability of regular septic tank maintenance. In the event that the tertiary collectors are inferior in terms of slope and floor conditions, there is the risk of rapid clogging. On the other hand, continuing use of septic tanks can only be justified in the event that regular maintenance/emptying is provided.

Coincidentally, the German Ministry of Science and Technology (BMBF) entered into a tentative agreement with the MOC to scientifically investigate and document the efficiency and effectiveness of 'septic tanks' that are commonly used in Vietnamese urban residences for the purpose of domestic waste water treatment. It is in the interest of the MOC to obtain reliable data and recommendations on the benefits of septic tanks within urban areas, in particular for existing urban built-up areas where the Government intends to construct centralized waste water collection and treatment facilities. The research should conclude on the function, advantages and disadvantages of 'on-site' septic tanks within the context of 'off-site' waste water treatment, considering technical, operational and financial objectives.

Within the scope of the research project the effects and efficiency of 'micro-fot', an additive for septic tanks, should be investigated.

2.1 Septic Tank Construction

a) Households in urban areas, which are suitable for decentralized/off-site sanitation solutions, should build septic tanks that are in accordance to a formal building code. Moreover, septic tanks should be placed and constructed in a way that allows future connection to a centralized sewer system.

b) Some research respectively 'best practices' should be established on the combined treatment of grey and black water in the septic tank.

c) Unless 'drastic' solutions are applied, as it is in the Buon Ma Thuot case, it is suggested to apply a 'soft' phasing out approach of existing septic tanks in newly constructed centralized sewerage areas. Some cities, like Hai Phong, maintain domestic septic tanks by providing de-sludging services, of which cost are include in the monthly waste water fee.

2.2 Septic Tank Operation

a) In the case of the existence of septic tanks in urban areas, regular maintenance should be part of a provincial/municipal regulation; including the set-up of standard operation procedures (SOP) for the service provider(s).

b) The city's public works company should be in charge of the establishment and maintenance of a septic tank 'data base'.

c) Regular maintenance of septic tanks requires the availability of central 'sludge treatment units'.

3. Economical & Institutional Aspects

The quest for sustainable waste water services lays in the application of cost covering mechanism for the service provider, frequency cited as 'cost covering customer tariffs'. Along with the introduction of service tariffs the 'replacement' policy for fixed assets must be defined between asset owner and asset manager.

As a matter of principle, consumers should be charged only ONCE for waste water services, just requiring a 'waste water tariff'. Consumers which are paying a waste water tariff should not be made liable for paying 'Decree 67 charge' nor an additional fee for emptying their septic tanks.

The MOF, in close cooperation with MOC and MONRE shall introduce a wastewater tariff calculation base and shall, subsequently, promulgate regulations on 'tariff adjustment' mechanism.

a) The introduction of an 'economic index' is suitable for distributing the available funds for waste water infrastructure more fairly between 'richer' and 'poorer' provinces, which would require the modification of Decree 108/2003.

b) 'Lessons learnt' must be disseminated more effectively, horizontally as well as vertically, through the development of appropriate mechanism [1].

c) The identification of 'least cost' solutions through cost benefit analysis must become a standard procedure during project development.

d) 'Pro-poor' policies must be developed to assure that marginalized citizens enjoy the benefits of appropriate water supply and sanitation services; e.g. financial assistance/micro credits/revolving funds should be made available as an incentive for connecting to a centralized sewerage scheme.

e) Economic and environmental considerations require the promulgation of regulations that make the connection to centralized water supply and sewerage systems compulsory. Implementation of such policies can be done incrementally, prioritizing on commercial and non-domestic customers.

f) Information and education campaigns (IEC) should become an integrated part of wastewater infrastructure development plans and projects.

g) Circulars shall be promulgated offering, among others: technical options, criteria for the selection of appropriate technical 'solutions', 'least cost' approach, time lines for the compliance of environmental standards and effluent limits, etc.

[1] The German Government is committed to assignment one long-term advisor for the Infrastructure Department of MOC and on integrated expert for the Vietnamese Water Supply and Sewerage Association (VWSA)/SEAWUN; among others, for supporting the dissemination process of 'lessons learnt'

APENDICIES

Annex 1: Brainstorming Matrix

Prevailing constraints				
Technical issues		***Financial issues***		***Awareness and regulations***
Bad treatment quality	Details connection require for the differential conditions	Cost to be born by the Household	WB experience : HH ability to pay is high	No community awareness of problems
Septic tank are never emptied	No place for ST construction	PC's willingness to charge is a problem	Low willingness from the household to contribute to sanitary infrastructure	Lack of public knowledge/information on ST
Non-maintained ST are useless	Current ST are not ST	Finance	Access to credit / loan	Direct connection is against regulation
Maintenance not doing regularly	Untight ST = pollution of groundwater	Practices/Customs	Cost for disposal of WW	No inspector and no penalty for discharging WW without permission
Risks on blog of sewers	Fouling WW = heavy corrosion of public sewers	Authority's perception		
Grey water need to be connected to the ST	Hard to find place for WWTP construction			
Difficult to collect WW	WW currently discharged without control			
No control about the HH connection point				
Difficult to separate WW from Stromwater				

(cont.) **Brainstorming Matrix**

Technical options			
ST operation & construction		***Criteria to choose the system***	
Grey water to ST, need of a study?	ST design standard is needed	ST **OR** central treatment	On-site treatment system is popular in rural areas
Grey water to ST	Treatment and disposal of ST sludge	Separated systems (not through ST)	ST is needed for low density rural areas
ST should treat black and grey water	„Micro-fot" conduction a study?	**NO** ST on a central system	New house construction allow easy connection to system
Properly designed and constructed ST should be	ST and JOUKASOU	New areas : Conventional sewerage only	Combined and separated systems according to areas
Should keep ST in the next few years	Use High technology ST	Decentralized systems with low running cost	WWTP construction in new areas
ST operation should follow Standard Operation Procedures (SOP)		Decentralized system in rural areas	New areas : separate system and WWTP

Economic and institutional aspects				
Cost / Finance	***Approach***	***Policy / regulations***	***Subsidies***	***Awarenes s creation***
??Septage?? treatment expensive	Starting with hotels and restaurants	Policies to support the poor	Subsidy connection cost	Important role of local authorities + Mass organization s
??Sadco?? can create ST database but emptying service should be opened for private sector	Who manages the public/common works	PC issue regulations	Incentives/su bsidies for low income HH	Promoting IEC
Existing HH need	Phased introduction	Control construction	HH	Information

Economic and institutional aspects

Cost / Finance	***Approach***	***Policy / regulations***	***Subsidies***	***Awarenes s creation***
financial assistance for connection	of off-site systems based on population density	and cleaning ST	connection : subsidies?	+ social marketing
Provide loans (revolving fund) to HH for connection	We have to work with HH	Compulsory use of ST	Subsidies for house connection	Campaigns strengthenin g
Increase fees to cover O&M cost	Contacts with HH	WW sector plan needed		To what extend is the socialization
ST too expensive if sewerage and WWTP available	High level treatment in small areas **OR** low level treatment in large areas	Need regulations of using ST		
Counterpart fund from the local budget		Regulations for emptying ST		
Financial solutions		Regulations of PPC		
Emptying cost are not included in the fee		Sewerage company should manage ST		
Contract for emptying ST		Compulsory HH connection to sewerage system		
WW tariff included in water supply tariff		WW usually discharged without permission. Thus need of regulations to make the WW treatment compulsory		
HH should bear the WW treatment cost				

Annex 2: Results Matrix

Prevailing constraints		Technical options	
ST O&M	Credit facility	Combine black and grey water	Sludge treatment
ST technical design center	Limited perception and awareness	Grey and Black water separated or together?	Cost benefit analysis
Current ST are not ST	No land for ST & Sewers	Treat grey water	Define connection point
Ability to pay : high or low	Control activities	Separated or combined	Keep ST where necessary
ST Or Public systems	Awareness of the community	Separate systems for new areas	Selection and design criteria
Poor ability of control	People not used to pay. Hard to change the habbit	Pipe where there is no space	Wide coverage with certain resources, **OR** Limited coverage with other resources
Small roads and lands make ST emptying difficult.	Lack of public knowledge and information about ST	Research on the Tam Dao mystery	Central system in new areas
Reduce 100% subsidies in the future	What is the house connection?	Central system without ST	

Economic aspects		Institutional aspects	
Introduce economic index	WW fee, while customer receive ST "services" for free	Development and implementation „Lessons learnt" Network	Horizontal coordination (between ministries)
VWSA and cities should work together	One payment	Awareness raising	Danish project
Piloting of systems	Policy for the poor	Decree : Technical options, Time lines	Focus on IEC, and use IEC materials
Centralized/ decentralized system	Empty ST on contract or monthly base	Technical circular : separated or combined systems	Criteria to define on the existence of ST in sewered areas
Demonstration		Customer satisfaction	

Annex 3: List of Participants in the Perception Building Seminar on "Effects of septic Tanks in Centralized Sewerage System"

November 03, 2006
Horison Hotel, 40 Cat Linh St., Hà Nội

No.	Name	Organization
1	Ngô Hồng Quang	Urban Infrastructure Department
2	Bùi Xuân Đoan	Urban Infrastructure Department
3	Nguyễn Phi Tòng	Urban Infrastructure Department
4	Trần Minh Chí	Urban Infrastructure Department
5	Trần Thị Thảo Hương	Urban Infrastructure Department
6	Ngô Đức Vinh	Department of Science and Technology
7	Hannu Melli	Finland Water Program
8	Nguyễn Trọng Dương	Finland Water Program
9	Trần Đình Khai	Finland Water Program
10	Lê Văn Dương	VIWASE
11	Bùi Văn Nghĩa	Thang Long infrastructure development consultant Company
12	Trần Đức Hạ	University of Construction
13	Nguyễn Việt Anh	University of Construction
14	Nguyễn Thị Kim Thái	University of Construction
15	Alan Coulthard	WB
16	Nguyễn Công Thành	WB
17	Peter .Daglish	WB
18	Lutz Kleeberg	GTZ
19	Max Preussner	GTZ
20	John Rockhold	Carl Bro
21	Đinh Thanh Tú	Carl Bro
22	Ông Nguyễn Đông	Project Management Unit of Urban Infrastructure
23	Đỗ Mạnh Hà	Project Management Unit of Urban Infrastructure
24	Wendy Poussard	BVI
25	Nguyễn Ngọc Điệp	Industrial Department-Government Office
26	Trịnh Huy Lập	Infrastructure Department - MPI

27	Hoàng Bắc Sơn	MONRE
28	Nguyen Tan Lien	Danang PMU
29	Do Trong Dat	Hai Phong PMU
30	Đặng Đình Lân	Quy Nhon PMU
31	Nguyễn Quang Hòa	Dong Hoi PMU
32	Nguyen Van Phát	Nha Trang PMU
33	Trương Công Thái	Buon MA Thuot PMU
34	Ông Đào Nguyên Vỹ	Hai Duong Urban Public Woks Company
35	Ông Nguyễn Quang Hòa	Bac Ninh WSSCo.
36	Ngô Bình Minh	Bac Ninh WSSCo.
37	Ông Rene Heinrich	DED
38	Tori Morotomi	Kyoto University School of Gov. & Graduate School of Economic
39	Mitsuo Kitagawa	Sewerage Works Management Division, Sewerage Business Management Centre
40	Gerry McManus	B&V
41	Mr. Kitano	JBIC Head Office
42	Nguyen Thi Van Anh	JBIC Head Office
43	Prof. Dr. Wagner	TU Darmsatd
44	Holger Neuweger	Moderator
45	Mr. Lutz Meyer	BORDA
46	Meike Zinn	BORDA
47	Nguyễn Thanh Tâm	BORDA
48	Nguyễn Thị Thu Hà	BORDA
49	Đinh Đăng Minh	WWM Project
50	Trịnh Quốc Khanh	WWM Project
51	Nguyễn Hoàng Long	WWM Project
52	Remi Zimmermann	WWM Project
53	Nguyễn Thị Thu Hiền	WWM Project
54	Lê Thị Vân Anh	WWM Project

Annex 4: Presentations

	Presented on	Presented by	Company
A.	Justification of Septic Tanks in Centralized Wastewater Systems	Mr. Max Preussner	CES
B.	Urban Sanitation in the Asian Context	Mr. G M McManus	Black & Veatch
C.	Connecting Households to a Separate Sewerage System	Mr. John Rockhold	Carlbro
D.	The Dam Tao Experience	Mr. Lutz Meyer	BORDA
E.	Septic Tanks and Connections	Mr. Alan Coulthard	World Bank
F.	Concept of On-site and Off-site Treatment Systems in Japan	Mr. Katigawa Mitsuo	JBIC

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