

# TOILET DESIGN FOR RURAL AREAS

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## ABSTRACT

Rural water supply and sanitation is one of major programs for rural development applied not only in Vietnam but also in other developing countries. However, due to poor income and low knowledge conditions, the numbers of farmers achieve this are not so high.

Currently, there is a little documentation in Vietnamese concerning toilet design have been found in bookstores and libraries although this is a real need, special for rural areas. For this purpose, a rural toilet design manual was just written in the College of Technology (CoT), CanTho University (CTU). Many types and forms of rural latrine - toilets have been illustrated. Otherwise, some ways for human excreta and urine disposal collection and treatment have been introduced also.

**Key words:** rural, sanitation, toilet design

## 1. INTRODUCTION

Currently, the rapid increasing of population and pollution problem is gone concurrent, special in where almost a large numbers of the low-income people are living on. This even is happening in almost the developing countries. Vietnam in general and the Mekong river delta (MD) in particular, there is very low ratio of population served by adequate sanitation, especially in rural, peri-urban and poor urban areas (Anh, 2002). Not many of poor households have own sanitation toilet (Table 1 and table 2), almost are using very simple septic tanks or overhung toilets in ponds or rivers (figure 1).

Table 1: Percentage of rural households owning latrines

	1998	1999	2000	2001	2002
% households	# 20	# 30	32	34	37

(Source: L. V. Can, 2003)

Table 2: Percentage of people accessing water supply and owning latrines in regions (2001)

Regions	Per cent (%)	
	Accessing water supply	Owning latrines
<b>Mountain area in the North</b>	39	<b>23</b>
Red river delta	50	47
The Northern of central area	44	41
<b>Coastal Central area</b>	42	<b>32</b>
<b>Highland area</b>	36	<b>24</b>
The Eastern part of the South	53	46
<b>The Mekong river delta</b>	48	<b>19</b>

(Source: National Strategy for Rural Water Supply and Sanitation, 2003)



Figure 1: Overhung toilet in pond in the MD

Vietnamese people once have an idiom "*Nhà sạch - Ruộng xanh*" ("Clean house - Green field") considered as a rich and sustainable rural indicator. In 1999, the National Strategy for Rural Water Supply and Sanitation of Vietnamese Government has stated the goals: "*Up to year 2010, about 70 per cent of households in rural areas have sanitation latrines and know how to apply personal hygienic*" (Decision No. 104/2000/QĐ-TTg, dated 25 Aug. 2000, signed by the Prime Minister). So, for this purpose, there was a campaign namely "Building 3 sanitation works: water wells, bathrooms and toilets" have been deployed several years and got some successful in many places in the Northern and the Central regions of Vietnam. However, this expectation seems not to reach the general objectives in many rural areas of the Mekong River Delta because of economic difficulties, low income, the poor of building materials in the countryside and the lack of required information and skills of communities imply thinking nothing of sanitation needs in farmers and/or even poor hygiene awareness in rural development staff.

Using toilet is one of actual human needs but it is really hardly to find some Vietnamese books and documents concerning sanitation facilities and hygienic human waste treatment in the libraries or bookstores, even simple ones. Otherwise, the ways for treating the excreta and urine as a source of mineral nutrient fertilizer have applied very little in the Southern of Vietnam. Humane urine has a high content of nitrogen, phosphorous and potassium (Simon, 2002). Thus, if one can separate the urine and find a suitable to have a mineral fertilizer and then distribute this fertilizer source back to the cultivated lands, we may achieve one of the goals for a sustainable eco-agricultural development. So, the main objectives of this report are to introduce:

- A rural toilet design manual, its significance, contents and application.
- An experimental concentration of nutrient in human urine.

## **2. RURAL TOILET DESIGN MANUAL**

Currently, the big gaps between the urban people and the rural people in Vietnam are their income opportunities, living standards, education and health conditions, and others. As a result, the farmers are limited to receive enough clean water supply and sanitation facilities as a social beneficiary. Furthermore, their living habits are directed toward the

simple nature. It is difficult to break the thinking to defecate and urinate to the open fields in farmers and communities' daily life. In general speaking, there are some reasons listed that have limited the numbers of rural toilet building:

- Low in-come;
- High cost for a sanitation toilet;
- Lack clean water;
- Hardly to find good building materials;
- Poor awareness in hygiene;
- Not to like to defecate in a cramped toilet;
- Consider human and animal excrement as a source for fish raising;
- Not to be interested fully in local governments and rural development staff;
- Very scare information and documents (books, guidebooks, manuals, ...)

Awareness the uncontrolled and libertine sanitation situation in rural area was a population cause in water body, since mid-2003 to early-2005, CTU had accepted to develop a know-how reference document as a manual concerning rural toilet designs (Figure 2). The main goal of this work is to write a guidebook as a basic knowledge for farmers, rural development staff and local governments in fixative designing and building available low-cost toilets. The document emphasizes to reduce soil and water pollution, to use recycled human waste and to protect environment (Figure 3). It focuses the technical structures of the rural waterless and water toilets that can be applied in different rural regions and available financial investment capacity, not only to introduce some models in other countries but also to improve existing ones. Otherwise the community based toilet management is introduced.

The structure of the manual, with five chapters totally, follows a logical sequence from the general pictures of rural toilet situation and problems in Vietnam, as reviewed in Chapter 1. Basic knowledge on rural toilet sanitation is encountered in Chapter 2. Coming to Chapter 3, some models of rural waterless toilets are introduced and analyzed their advantages and disadvantages. Similar, in Chapter 4 presents rural water toilet structures and also to compare their both sides of cost and benefit. Later, how to develop and manage toilets in community is discussed generally in Chapter 5. Finally, additional reading documents as reference are listed. An English - Vietnamese Toilet Dictionary is also added shortly at the end pages of the manual.

### **3. DISCUSSION**

It is necessary to distribute widely the know-how technology to the farmers. The aim of this research is to help rural communities some available low-cost technical documents. The rural toilet design manual has finished its final draft and being last edited. We need a financial support for publication.

A study of separated urine collection and treatment is going on. It is an interesting research with full of promise in theory but there are some rocky application in practice as mentions above. Anyway, urine applicable for rural development has very useful and meaningful not in social economic but also in eco-environmental protection.

### **5. ACKNOWLEDEMENTS**

The author would like to thank financial support from CTU through his science research fund for development the manual.



Figure 2: Cover of rural toilet design manual

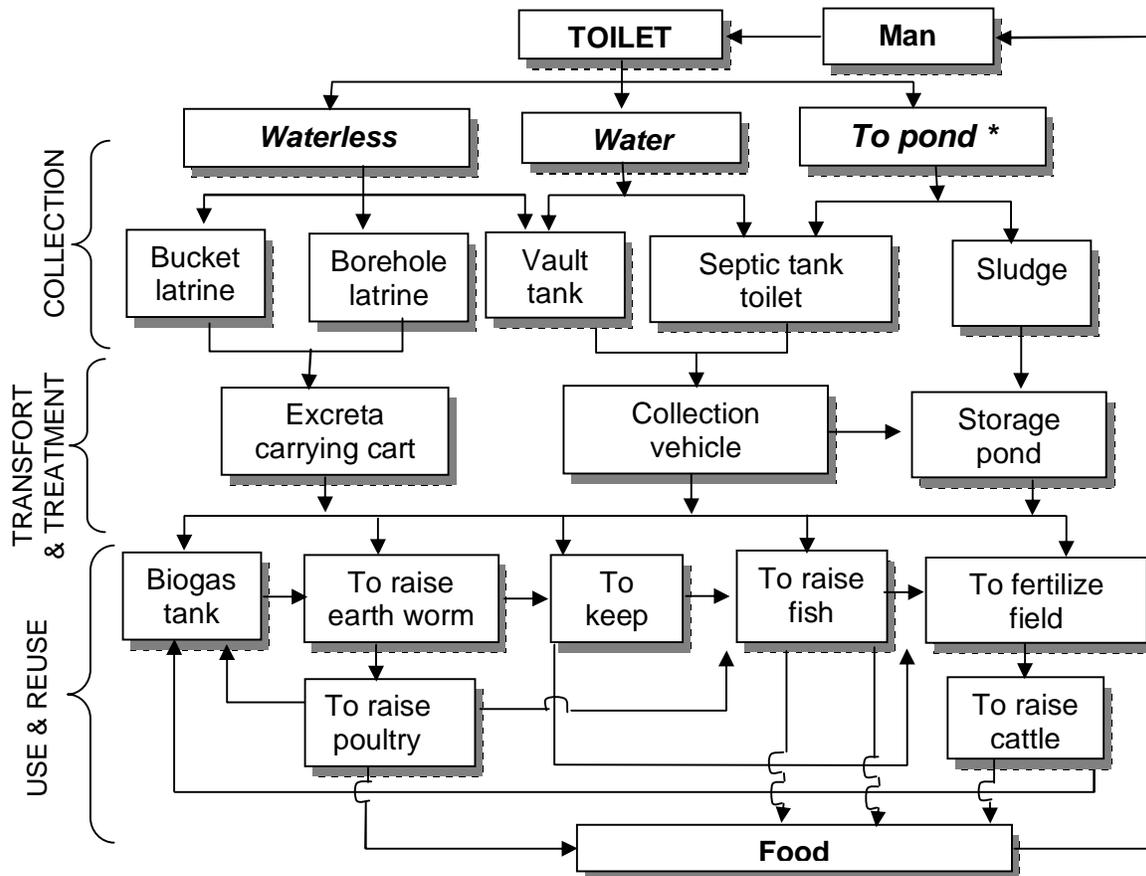


Figure 3: Toilet classification, treatment and reuse system