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ecosan - closing the loop in wastewater management and sanitation

Cultural Aspect of ecosan

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Abstract

When planning an ecosan system, three cultural considerations must be addressed:

1. **psychological deterrents** associated with the handling human waste, which tend to be universal,
2. **gender issues**, which are both universal and local
3. **the influence of religion**, which varies regionally despite universal doctrines associated with a particular faith.
Toilet psychology

When developing an alternative toilet system, formulating a psychological contract with the potential users is just as important as designing the system itself. A system often fails, not because of technical reasons; rather, because it simply is not used. Therefore, it is vital to understand the psychological processes of waste treatment as much as the biological, chemical and physical processes of the system.

We can better understand the psychology of waste treatment by examining three basic elements.

- **Attitudes** toward excrement are universal.
- But *behavior* regarding the handling of excreta varies from cultural to culture.
- And *motivations* for using an ecosan system are many:
  - hygiene
  - soil improvement
  - financial
  - aesthetics
  - comfort
  - status
Universal Attitude
Exrement is sordid!

- What is attitude?
  - Perception = emotional impression
  - Cognition = thoughts
  - Behavioral tendency

People are naturally repelled by excreta. *Natural* in the sense that it is an involuntary reaction. The reason is as much evolutionary as cultural. In the course of human evolution, those unfortunate to come in contact with excreta were exposed to a plethora of pathogens, and consequently less likely to survive than those who did not come into contact with excreta. Therefore, some assume that this instinctive repulsion is almost genetic in nature.

So, what is this universal attitude? An attitude consists of three basic components:
To begin with, let’s examine perception. Essentially it is our emotional response(s). If you like, it is the way we feel – as opposed to think – about something. Logic and rational thought have little if anything to do with perception.

Consider some common perceptions about excreta. The emotionally charged associations vary from culture to culture, but are essentially negative. Now, consider some universal perceptions about water, which also vary with culture; however, they tend to be positive in nature.

The development of water-based toilet systems might – and probably do – have a deep-seated psychological link, with water providing a mental barrier of protection as much as a physical one.

- Excreta
- dark
- defiled
- Evil - dangerous
- bad
- repulsion

- Water
- clear - reflecting light
- pure
- God/heavenly - safe
- good
- attraction
The second element of attitude is cognition, which deals with our rational thoughts. Similar to perceptions, generally speaking, universal notions about excreta are threatening and harmful, whereas attributes about water are healthy and helpful.

The apparent polarization between the qualities associated with excreta and water does not necessarily imply conflict. A rational mind might logically combine the two to neutralize the polarity. In the same way that primitive man realized that fire can make one warm and thus survive hostile environments, early man might have reasoned that water can cleanse remnants of excreta and further enhance survival.
Behavioral tendency

The third and last element of attitude is behavioral tendency. Although there is a link between how one feels and thinks about a subject, there is no direct cause-effect relationship between these elements and specific behavior. Rather, there is a tendency, and merely a tendency, to behave in a specific manner, which explains why some cultures are more disposed to handling excreta than others.

Our behavioral tendencies toward excreta are instinctive. No one tells us that excreta smells bad, any more than others tell us that food with a savory aroma smells good. We intuitively trust our instinctive senses and behave accordingly.

Likewise, when threatened, we naturally react according to the degree of danger. One of the most instinctive reactions to an instinctive threat is to remove oneself from the situation. Any other tendency would jeopardize survival.

- Natural reaction to senses
  - sight, sound, smell, touch, taste

- Threat response
  - fear...flight
  - anger... fight (insult)
  - disgust... face, but back away
  - evolution: any other reaction leads to death
A fundamental point to understand is that our attitude towards excreta is influenced by experience, and that attitudes evolve and change over time.

We all eliminate wastes: that is a basic fact of life. How we actually perform the elimination act, and what we do with the waste, is partly dependent upon one’s sex, religion, age, health, diet…, and most importantly what facilities, if any, we are accustomed to.

Although little research has been devoted to these issues, studies do exist. For example, Prof. Alexander Kira, Cornell University (USA), conducted a study to determine peoples’ tolerance towards offensive body waste. Not surprising, those who are exposed to excreta – such as mothers of infants and health care professionals had a higher tolerance. The implications for ecological engineers are far-reaching. Don’t assume your level of tolerance, based upon conditioned experience, is the same as potential users of your ecosan system.

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**Disgusting Research!**

- rank: dandruff, ear wax... to feces
- tolerance:
  - women
  - health professionals
- don’t assume...

EcoSan
There is no right or wrong behavior or attitude, except within a given cultural context. But even within the same culture, our behavior can be influenced by a number of factors – and these develop over time.

Consider the development of Western attitudes towards toilet behavior and disposal of waste (generalized of course). Infant behavior is cute and amusing, which might explain why many don’t take the threat of fecal contamination serious. In fact, many actually believe that infant feces are harmless. As we mature and become more social, attitudes and behavior change. Often our first social-excretal experience is the horrid school toilet, which is often associated with deviant behavior: shame, disgust, bullying and abuse. This might explain why, as adults, privacy become a primary concern, and public conveniences are rarely convenient. It is not surprising that one of our most natural functions becomes unmentionable, and consequently becomes masked in aphorisms.

Negation evolves with age

- Infant: miselading if not cute
- Children: the horrid school toilet
  - Ridiculed - **Raise your hand** (1 or 2)?
  - Place of shame, disgust, bullying, abused
- Adult: privacy is mandatory
  - Natural functions become unmentionable
  - Using the toilet, going to the bathroom, taking care of necessities, relieving onself, answering the call of nature, taking care of business… see a man about a horse?
- Public **conveniences** are rarely that
Another consideration is *gender*. Gender plays a universal role in privacy, but equally important are the physical differences between men and women. Women urinate more frequently (especially when pregnant), and use more time to eliminate wastes and get (un)dressed, than men do.

For public toilets, there are even greater concerns. Women use public facilities for more reasons, such as breast feeding, changing diapers and, yes, escaping men. And they use public facilities more often than men, because they’re in public places more often, such as shopping.

But studies have shown, that in many regions of the world there are far fewer facilities for women than men. In the U.K, for instance, until recently men had *twice* as many public facilities as women.

- Physical differences
  - urinate more frequently - especially pregnant
  - more time - (un)dressing and physically
  - use public facilities for more reasons
    - breast feeding
    - changing diapers
    - escape men...
  - use public facilities more often
    - shopping
    - care of relatives
Ecological engineers should be acutely aware of gender issues associated with public toilets, because many ecosan systems are public facilities. The success or failure of an alternative treatment system might well hinge not on system performance, but on system use – or lack of.

System design should not necessarily be based upon existing cultural conditions, because, in fact, the current cultural context might well be flawed from the point of hygiene. This is especially critical if the number of public facilities are (unjustifiably) disproportional.

Keep in mind, most toilet systems have been designed by men, who often are not aware of female needs, much less desires.

Lastly, note that times are changing – for the better. Until recently corrected, there were no women’s toilets in the U.S. Senate or the British House of Parliament simply because there were no female legislators to use them.

- Fewer facilities for women (sports & offices)
- Fewer units (female urinals?)
- Designed by men (too small)
- Cultural variation
  - Japan unisex (sound conscious)
  - Islamic (expose feet)
  - Nepal (meeting place)
Gross generalizations are dangerous, and too often misleading. However, for an economy of time and space, they are necessary. Having said that, we have noted that women tend to have a greater tolerance towards handling waste; use public toilets more often, longer and for more purposes, yet have fewer facilities than men.

Another generalization is that women tend to manage the home toilet more than men. In cultures where women stay at home, the toilet becomes a primary management issue, because their primary responsibilities of cooking, housekeeping, family hygiene, and care giving to infants and the elderly are toilet dependent.

For ecosan projects involving compost or dehydration toilets, this is a vital concern, because these systems require at some time – and usually often – the handling of excreta.
Before we begin with the final cultural concern, the influence of religion, let us note that until the 19th century, cleanliness was not a scientific concern. Our understanding of water and excreta was not associated with molecules but myths, and the terms *hygiene* and *sanitation* were not part of the popular vocabulary. Nevertheless, many cultures did – and some still do – make a distinction between *clean* water and *cleansed* water. (The former being perceived as pure and potable, the latter being neither.)

Also, let’s dispel the common assumption that science and religion are always in conflict. Both share a common concern about human excreta – namely, human health. Science’s interests in wastewater treatment stems from two issues: the transmission of faecal related diseases and the conservation of water and nutrients in the waste. Religion’s interest in wastewater is also two-fold: the promotion of health (although most religious doctrines lack medical explanation for disease), and the observation of rituals associated with purification (in the broadest sense of the word).
The interests of science and religion are neither incompatible nor contradictory. The heart of the conflict is that science and religion deal with human behavior differently. Science tends to introduce new concepts and modifies behavior, whereas religion generally preserves old beliefs and maintains traditions. Thus, conflict arises when science tries to alter religious behavior, including behavior that is related to health and hygiene. ecosan mitigates potential conflict by integrating science and religion into a system that is as sensitive to social concerns as the physical environment.

The heart of ecosan is a holistic approach towards treating human waste, which implies sustaining the human ecology as well as the biota. Consequently, the key to a successful ecosan system is its adoption to specific cultural requirements. In the same way that local geographical issues must be taken into account (e.g. weather, soil, vegetation, etc.), so must cultural considerations, not the least being religion.

### Religion

- 80% of world - substandard housing
- 70% non-Christian
- Major religions
  - Judeo/Christian
  - Islam
  - Hindu
  - Buddhism
Water has always had a special significance in religious purification rituals. But the use of water for sanitation – in the broadest sense of the word – generally has less to do with physical hygiene than spiritual cleaning, i.e. ablution. Spiritual cleansing is not limited to the Judeo-Christian heritage. One has only to see and smell the Ganges to know that the mass immersions in that holy river have no connection with hygiene.

Although Judeo-Christian rituals frequently require water for purification purposes, it ’s apparently absent in reference to toilet behavior. Deuteronomy 23:12-13: Thou shalt have a place also without camp and it shall be when thou wilt ease thyself, thou shalt dig therewith, and thous shalt turn back and cover that which cometh from thee. Nowhere does it say to wash after easing thyself.

Cleanliness did not become a Christian virtue until the 19th cholera epidemic of London. It was at this time that Rev. Moule invented the Earth Closet, which is claimed by some to be the first (indoor) compost toilet.

Judeo-Christian

- Water used for purification
  - baptism, kosher, Pilate...
- Deuteronomy 23:12-13
- Monasteries (Middle-Ages)
- Hygiene Virtue (1800s)
  - cholera claims 30,000 souls
- Rev. Henry Moule’s Earth Closet
Moslem doctrine, however, prescribes strict procedures to limit contact with faecal material, because – by Koran edict – it is considered impure (*najassa*). A Muslim must use water to cleanse parts of the body through which najassa pass.

The hygiene behavior of Muslims varies because the Koranic edicts are interpreted differently among different movements. In Iran’s Shiite society, for example, the use of excreta in agriculture and aquaculture is not condoned. In West Java, however, direct application of excrement for aquaculture is an ancient practice that has altered little under Islamic rule.

Theocratic rule may have implications for non-believers as well. For example, the Malaysian Cabinet has directed local authorities to incorporate the water requirements of Muslims in the design of public toilets.

Also note, although Islamic law requires the use of water for anal cleansing, waterless toilets are a tradition in Yemen and Zanzibar.

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Islam

- **Koran**
  - feces are *najassa* - impure
  - anal cleaning
  - no use of blackwater, except…
  - different interpretations
- Malaysian public toilets
- Yemen’s waterless toilets
- Afghans kneel
Waterless ecosan systems (i.e. dehydration toilets) have been successfully introduced in water-based Hindu cultures.

The principal Hindu text that details the code of conduct for rituals, the Artha Veda (500-200 BC), clearly specifies the use of water for sanitation. The feet are to be washed before elimination and the anal region is cleansed with water afterwards. The end of the ritual is symbolized by rinsing the mouth eight times with water. But note: there is no obligation to wash one’s hands after defecation.

Although it is difficult to imagine entire urban populations following these rituals, one can see the impact of religion on water usages and waste treatment – as well as class distinction. Followers of the Artha Veda are primarily upper-caste Brahmins; those who carry the nightsoil, are lower-caste Untouchables, who do not have prevalent religious attitudes about handling excrement.

- **Artha Veda** (500-200 BC)
  - ritual washing (hands?)
- Caste away the problem?
  - Brahmins
    - observe hygiene rituals
    - more suited to alternative
  - Untouchables
    - handle the night soil
    - less like to afford alternatives
Unlike the West, the Far East evolved cultures predisposed towards using excreta. Unlike the rich Mediterranean landscape that cultivated the principal religions of the West, the food baskets of the Far East were never envisaged as lands of "milk and honey". Intensive cultivation practices evolved to feed large populations, and this necessitated the careful use of all resources – including excreta.

Nowhere do we find excrement included more in a social context than in Buddhist cultures. An integral dimension of Buddhism is reincarnation, which preaches the natural process of recycling human energy – birth, growth, decay, death, and re-birth. Since reincarnation promotes the harmonious concept of recycling life’s treasures, it is not surprising that Buddhist cultures treat earthly resources similarly. But bear in mind that the unenlightened had been applying excreta to crops 3000 years before Buddha first began preaching about spiritual composting.
Aside from the noted major religions, there are many others that address the treatment and use of excrement. Some cultures practice the burial of feces to ward off evil spirits. Other cultures use urine for purification and healing. Others still, like the Maoris, forbid the practice of allowing human waste to enter rivers: do not defile that which is pure.

Taboos and superstitions are so varied worldwide that is misleading to make generalizations. For example, in sub-Saharan Africa, there is no tradition at all of using human excreta in agriculture. But it is difficult, if not impossible, to determine if this behavior is the cause or the result of religious beliefs.

The one thing we can say with certainty is that some (perhaps much) of faithful behavior is contrary to logic. This has direct implications to ecosan engineers who prescribe recycling excreta for logical reasons.
Comparing the major religions, one might conclude the following: The edicts of Islam and Hindu tend to influence the treatment of wastewater; whereas Judeo-Christian and Buddhist doctrines appear to be the result more than the cause of how followers of the faith should treat or handle excreta.

Of course, this conclusion can be debated. Some might argue that the Far East considers excreta a resource rather than a waste because of the historic need for fertilizer. Others might argue Eastern cultures tend to be faecophillic because there is a noticeable absence of religious doctrine regarding the handling of excreta. Still others might claim folk beliefs of the Far East are not concerned with salvation or the supernatural, but are sustained by earthly fears and rewards. In other words, Taoism, Confucianism and Buddhism are more oriented towards philosophy than theology; and most philosophies find a thing in itself neither good nor bad. How one uses the thing – whether it is enlightenment or excrement – is the rudimentary question.

Apparent influences of religion

- Islamic & Hindu edicts
  - tend to...
  - influence wastewater practices
- Judeo-Christian and Buddhist doctrines
  - appear to be the...
  - result more than the cause of cultural practices
Conclusions

- **Psychology** - There is a universal negative attitude towards excreta. But behavioral acts of elimination and treatment, including handling and use, vary worldwide. Motivations for use are as diverse as the systems that treat the waste, which might explain a logical link between why and how we handle excreta.

- **Gender** – The physical and social demands for toilet uses varies not only between men and women, but also between women themselves, from culture to culture. This is especially true when it comes to public toilet provision and private toilet management. Generally speaking, women use public toilets more often for more purposes than men, however they have fewer facilities, which tend to be inadequately designed.

- **Religion** – Religion tends to influence toilet behavior and wastewater treatment more in Eastern cultures and developing countries than Western industrialized lands. The reverence for water, and its spiritual association with purification, appears more universal than the varied doctrines associated with elimination and disposal (or use) of excreta.

- **A final comment for “ecosan engineers”**: Cultural norms about waste treatment are universally similar to those on diet. The norms toward both are both inherent and learned, and deeply rooted in psychology, gender and religion, which might explain why modifying a tradition of waste treatment is often as difficult as modifying a traditional diet. But to modify another's diet is one thing; to replace it it is quite another.
REFERENCES


