

Ecological Sanitation and Urban Agriculture

Local treatment and recycling of sewage (soapy “grey” water) and the reduction or even non-generation of wastewater are viable options that should be considered and supported within a municipal policy of sanitation and sewerage systems, that also takes urban agriculture into the equation.

Such solutions are legitimate, especially since many municipalities lack the capacity to provide costly drainage works and water-treatment plants, even in the more economic and viable versions, such as stabilisation ponds. This is especially true for the urban zones located in steep and/or stony terrains, as well as for those municipalities with problems of water supply. In Latin America and the Caribbean, this counts for 60% of the cities.

The main challenge for this type of solution is the need to provide information, set up demonstration sites with families and/or public institutions, organise meetings and participatory workshops to analyse the problems and their possible solutions, and to establish municipal incentives for those who adopt these technologies, as contributions of building materials and/or rebates in property taxes or water charges.

A CHANGE OF PARADIGM

Ecological sanitation is an alternative to the linear “solutions” to carry waste (excreta, soapy water, industrial water, etc.) to rivers, ponds, underground waters and seas that cause serious problems of pollution and public health. In municipalities with water shortages and a lack of other resources, it is neither viable nor recommended to “use 15,000 litres of treated or potable water per person per annum to evacuate 35 kg of faeces and 500 litres of urine *per capita* each year. In developing countries, more than 90% of the sewage is discharged without treatment” (Esrey, *et al.*, 2001: 13).

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Ecological sanitation also forms a viable alternative to “latrines”, the conventional solution for poor people in developing countries. This “drop and deposit” model encounters serious problems, especially in densely populated areas where the subsoil is impermeable, aquifers are shallow, or are prone to flooding. There is the risk that groundwater will become contaminated with pathogens like nitrates, leading to the pollution of potable water as well as irrigation water used for urban agriculture.

Ecological sanitation is based on an ecosystems approach. The nutrients and organic matter contained in human excreta must be considered as a resource and properly treated for its contribution to food-production systems. Ecological sanitation further allows for recovering and recycling nutrients in a safe and non-polluting way, with zero discharge. This is especially relevant in its relationship with urban agriculture, as it allows for a closing the cycle of nutrients, facilitating the cultivation of legumes and other vegetables in an ecological way, without agrochemicals (*see Figure 1*). This technology addresses households and requires community involvement. Ecological sanitation further serves to improve the family diet and its economy, as well as the self-esteem of its members. It also strengthens beneficial, responsible and committed community relations.

The proposed techniques include:

- ❖ Dry toilets with diversion of urine.
- ❖ Gravel, sand and purifying aquatic plant filters.
- ❖ Composting, which gives a secondary

treatment to solid excreta from dry toilets.

- ❖ *Organoponics*: a production system that uses urine as its main source of fertilisers.

The “*Organoponics*” technique developed in Mexico by CEDICAR A.C. (Arroyo, 2000) consists of the production of small gardens in containers using urine as a liquid fertiliser, and soapy water that is filtered domestically to irrigate the gardens.

THE MEXICAN EXPERIENCE

In Mexico, several experiences have been recorded regarding the implementation of ecological sanitation programmes. The more negative experiences result from the implementation of technologies without prior work in the communities. This is often the case with unilateral initiatives by local governments, which although well intentioned, are felt as an imposition. To some extent they are not connected to the expectations of the population and therefore rejected. As a result, many dry toilets, for example, are now used as sheds or small chicken coops.

The more positive experiences mostly coincide with preparatory work having been carried out with user populations, including: demonstration sites in the same community or visits to other communities that have adopted these technologies; community diagnostic workshops with an emphasis on ecological considerations; collective analysis of problems and possible solutions in which the advantages, disadvantages, viability and freedom to adopt the technology and its methods are discussed and decided upon by each household. Although this point is the most important, local governments or other central government units must give additional incentives or assistance in order to build dry toilets, install grey water filters and collectors to catch rainwater.

REFERENCES

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