A Hungarian Experiment

Integrated Management of Soil, Energy and Water

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(adapted and translated by André Leguerrier)

Towards independent thinking and a form of autarky

The solutions herein reported partly result from experiments made by a rather poor and disadvantaged rural population in Hungary. Their experience opened the way to a form of autarky. The solutions tested are all totally illegal in Hungary (as well as elsewhere in Europe). Those who initiated these had no choice because of their extreme poverty: they could no longer pay the water, heating and mains sewerage bills that were imposed on them by a corrupt government, influenced by water and energy multinationals. Another aspect that cannot be neglected is that because said solutions are illegal, those persons who adopt them do not tend to boast about it, making it difficult to know their whereabouts and get a full picture of the situation. In a way, these are situations of « ecological civil disobedience ».

The rise of problems

Before the implementation of mains water supply networks by the communist regime of the 1970s, each rural house had its own well, from 5 to 15 meters deep, providing poor quality water. Drinking water was available only at public water points supplied by artesian wells. After the onset of mains water supply networks, the wells were abandoned and covered with a concrete slab. Water supplied by the communist government was free – or almost. With the demise of communist power, forced « privatization » eventually reached the water and energy sectors. Multinationals managed to impose the installation of sewers in even the smallest villages, often in sparsely populated areas. European water management subsidies funded this totally unnecessary work. All water services were handed over to multinationals, resulting in a dramatic rise in the price of water, heavily impacted by mains sewerage fees. Just to pay the annual bill for water supply and wastewater treatment required more than one month's family income for the poorer families. Added to this was the gas bill for heating, demanding 3 to 5 months of family income annually from these same families.

Drinking water for the whole family – no mains water supply

A small part of the population, thus forced into extreme poverty, ended up finding local inexpensive solutions. Priority was put on drinking water, the only source of which was mains water. It was out of the question to resort to bottled water, too expensive. Through reading the Hungarian pages of the EAUTARCIE website (www.eautarcie.org), the stage was set. To reduce the water bill, the old wells were recommissioned wherever they were present. Pressure pump units were used to supply well water for non-food uses in the households. For drinking and cooking, the households eventually found the solution: a reverse osmosis unit for each household. By following advice found on the EAUTARCIE website, preference was given to the least expensive units, sold for aquariums for less than 60 €. Starting from mains water or well water, these provided water of a quality comparable to the best mineral waters on the market.

Wastewater treatment

Wastewater treatment costs being very high, the only available option to reduce costs was to dry up the sewers. Upon reading the EAUTARCIE website about how « the more wastewater is treated, the more it pollutes and the greater the environmental destruction », some took action without hesitation. The starting point, and the most important step was the removal of the flush toilet and the installation of a Biolitter dry toilet (BLT) [1] that Hungarians call « alomszék » or « litter toilet ». The rest, if I may say so, « flowed from the source ».

Greywater

The Great Hungarian Plain region is as hot and dry as the South of France : in summer, water is « worth its weight in gold ». The Hungarians soon discovered that soapy water (laundry, dishes, baths, cleaning) is not only a valuable commodity for watering the garden, but with its load of detergents and soaps, helps fight plant disease and parasites. Therefore in summer, households convey these suds directly into the garden, at the foot of the plants, without any prior treatment [2]. They ensure a uniform distribution of water throughout the garden. Plants attacked by aphids are sprayed with soapy water instead of being watered. Irrigation is done under a layer of mulch. In winter, greywater is accumulated in one or more small ponds lined with plastic sheeting. Thanks to greywater's warm temperature, parts of these ponds are always frost-free. In these ponds, under the effect of daylight, the water becomes clear more or less rapidly. In the spring, the water is ready to use for plantings. Those who lack a garden and do not wish to be bothered with the chore of greywater recycling will have a setup that conveys greywater directly into a subsurface dispersal drain, an underground soakaway or even into an artificial (and luxurious) wetland located at the lowest point of the garden; all environmentally harmless.

Dry toilet effluent

BLT dry toilet effluent is actively processed through composting, either to fertilize the garden or help heat the home in winter. Older persons who do not have the strength or energy to handle a pitch fork will use an easier ground surface composting technique.

Composting to heat the home

In the late fall, at the start of winter, a heap of 5 to 10 m³ of ramial chipped wood (RCW) [3] is brought to the home and soaked with water for a few days. This is the first step towards setting up a composting heap for thermogenic (heat-producing) composting. The soaked RCW is then mixed with the annual cumulated BLT dry toilet effluent. The resulting heap is located near the house, built around a heat exchanger made of hard plastic pipe (the kind used for sub-floor heating) formed of one or two cylindrical coils set up on a horizontal or vertical axis. This heat exchanger is connected to the house's sub-floor heating system by means of a well-insulated pipe. Water is circulated in the pipe using a circulation pump. Hot water produced by the heat of the composting process diffuses its heat in the home. That's all. In the compost heap, the temperature quickly rises above 60°C and

[1] See webpage: http://www.eautarcie.org/en/05c.html .

[2] These are individual experiments, not reproducible systemic studies, and are provided for indicative purposes only. On a family scale, in the event of a mistake, feedback is immediate: any household product that is harmful to plants will quickly be revealed through whatever damage shows up in the garden. Once such harmful products are identified and eliminated from the market, these experiments are probably transposable on a larger scale. Also see webpage : http://www.eautarcie.org/en/04a.html#d.

[3] See webpage: https://en.wikipedia.org/wiki/Ramial_chipped_wood.

slowly goes down to attain 25 to 30°C by the end of winter. Hungarians call this set-up a « komposztkazán », which translates as « compost boiler ». It provides hot water for the heating system for all of winter, at a temperature of 25° to 35°C. At this temperature, in Hungary's winter, the facility provides a base space heating equivalent to around 18 or 19°C in a small home. This needs to be supplemented with auxiliary heating to bring the temperature up to a more comfortable 20 to 21°C. For example, the temperature of the house can be raised with a small woodstove fire.

As the technique is still experimental, we are still looking at ways to revive and maintain the compost boiler's heat when its temperature drops. The temperature drop is often the result of excessive evaporation of the compost heap. One solution is therefore to add water. Sometimes the heap has compacted too much, leaving little air for the thermogenic bacteria to thrive. It then becomes necessary to stir the pile, introduce a little air through pipes, etc. I witnessed how this system can perform : a 200 m² two-storey moderately insulated house was heated for two consecutive winters with 9-m³ heaps of composted RCW, supplemented with the total accumulated dry toilet effluent « produced » by a family of 4.

Vegetable production

The most valuable part of this whole system is the compost obtained from the RCW heap, after it has delivered its thermal energy. This still immature compost is spread on the ground in a layer of 5 to 10 cm thick. You can plant or sow it, but the yields are not very high in the first year. After seedling emergence, you cover the soil with a 15- to 20-cm layer of straw (or mulch), to shade the soil and conserve moisture. Earthworms will soon appear in large numbers to transform the underlying immature compost into humus. The soil underneath then becomes lighter, richer and more fertile. Then every spring, you mix in about 2 cm of new compost into the mulch that remains from the previous year. On such land, you need not worry about digging, plowing, hoeing, weeding and watering.

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