

AVLOPP & KRETSLOPP 2001

Report from the Annual Swedish Conference on Sewage and Recycling



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Avlopp & Kretslopp in Swedish might be translated to Sewage & Recycling. The word "kretslopp" is not as available in English, but what we mean is "closing the loops", and how we can achieve that by using sewage, or waste products, is what the meeting is all about.

This year's conference was the fifth (I think) and took place during 28-29 March in Linköping as usual. The organisers were Anna Lena Persson (ALP conference service) and Mats Johansson from Verna Ecology. Approximately 200 participants, most of them from municipalities around Sweden attended the conference.

During the two days different stakeholders' view on the issues, results from research and projects from different parts of the country were presented and debated.

Welcome

Roger Bergström from the Swedish Water & Wastewater Association (VAV) started with the news that VAV soon probably will change their name to Swedish Water. For the future VAV is convinced that the plant nutrients in sewage sludge need to be utilised, otherwise we will not manage the environmental goals the Swedish government has put up. However, they agree on that further research regarding health, environment and economy is needed.

Introductory presentations

Mats Johansson gave us a retrospect on the sewage and recycling issues and declared that a lot has happened. One example is source-separation of human urine that for a few years ago was met with a lot of scepticism but now is a well functioning technique that are met with interest, also internationally.

One important question is who should be driving the development. So far researchers, inventors and individual municipalities have taken on a lot of the responsibility. It is now time for the politicians to take part in the actions. Legislation might be needed to obtain healthy economics around closing the loops.

Carl Etnier, PhD student at the Agricultural University of Norway, gave us a global view on recycling. One conclusion was that Sweden is at the front in closing the loops. Carl also talked about decision tools and multicriteria analysis, which may be needed for decision making regarding wastewater systems. The most important thing is to involve all stakeholders.

Future waste products — What does the farmers want?

Jan Eksvärd from the Federation of Swedish Farmers (LRF) meant that the phosphorous is not an acute, but a long-term problem that needs to be solved. For

nitrogen it is mainly the energy consumption in the production of fertilizers that give cause to recycling. Metals and how to set guidelines should be prioritised now, and we probably need to consider the problem at a farm level rather than to set general guidelines, since the risk is dependent on the relative increase in the ground.

The food industry's attitude regarding the use of waste products is generally restrictive. This is based on the consumer's perceived risk. For the food industry to gain anything from using these products, the quality and the security of their goods, their environmental effect and the consumers trust must be at least as good as if conventional fertilisers are used.

It was much appreciated to hear the view from a farmer. **Ola Persson** meant that the demands for efficiency have created systemic errors in farming. We used to believe that the soil was invulnerable, but the list of pollutants is now long. He stressed the need for political support since the farmers can not take an individual response for the benefits of the whole society.

In a discussion it was suggested the certification of waste products might be a path to follow, both for the agricultural and food industry. Depending on the class, different rules could be applied.

Hygienic risks and pharmaceutical compounds in wastewater

There has been an ongoing debate about pharmaceutical compounds in waste products and their possible effect on terrestrial and aquatic systems. Investigations have now started, in Sweden and in other countries like Germany, USA and Great Britain. **Cajsa Wahlberg** from Stockholm Water Company and **Magnus Johansson** from Umeå University provided us with background information and talked about their ongoing projects.

In Sweden (FASS) there are 1'052 medical substances registered and 70 of these have been identified in the environment (since they have been analysed for). Since 1995 there have been rules to make environmental assessments for new substances in Sweden. EU (Emeas) has a suggestion for guidelines where concentrations in aquatic environments have a limit of 0.01 µg/l. A higher concentration demands for toxicity tests. One shortcoming is that synergistic effects can not be evaluated.

The reduction of estrogens in 18 sewage treatment plants was found to be 60-100%. The maximum concentration in outlets was 0.015 µg/l and had no effect on fish in the recipient. In 100% wastewater there were substantial effects on fish in half of the trials. It is also important to treat the problem at its source and Stockholm Water is trying to decrease the addition of pharmaceuticals through information to the public and routines for collection at hospitals etc.

One statement was that "*it is impossible to predict the concentration of any pharmaceutical in the environment with today's knowledge*". We need to know more about the stability, transportation and the effects of the substances. New analytical methods are also needed.

According to **Ann Albihn** at the Swedish National Veterinary Institute (SVA) Salmonella has been found in all samples from eight sewage treatment plants. Control of sewage sludge should preferably include both analyses of the final product and of the treatment process. An important reason for us to be careful is to avoid a backlash, which probably would occur if a disease outbreak would be traced to a recycled waste product.

Jakob Ottoson from the Swedish Institute for Infectious Disease Control talked about risks related to greywater (bath-, dish- and washing water). In Sweden it is quite common with local treatment of greywater and the systems may involve open dams like in Vibyåsen, Sollentuna. Enteric pathogens may emanate from shower and bath, from washing clothes and textile diapers and from meat products. By analysis of the reduction of indicator bacteria the risk for infection by accidental ingestion of 1 ml of the water from the dam was estimated at 1:1'000, that is if 1'000 persons would visit the area and be exposed to the wastewater 1 person would get an enteric infection.

A debate followed, where **Thomas Hellström** from VAV said that the hygienic risks related to sludge is very exaggerated, a view that not was shared by the experts on

disease control, **Ann Albihn** from SVA and **Thor Axel Stenström** from SMI.

Different scales

The individual wastewater systems need to be considered since they contribute to eutrophication and involve health risks. A rapid development in treatment techniques are now developed and evaluated. The stability, or robustness, of the systems, possibilities to measure their performance and organisational matters are important issues.

It has been estimated that in Sweden approximately 1'000 smaller sewage treatment plants (<5'000 person equivalents) need to be upgraded within a five- year period. A comment was that on this scale the protection of the recipient is often achieved, whereas there is less success in closing the loops. In production of energy crops (e.g. short-rotation willow coppice) there is a larger demand for nitrogen, whereas the phosphorous is needed in food production

Hammarby Sjöstad in Stockholm is at present the largest construction site in the Nordic countries. In this urban area the environmental goals are set high. One project involves the joint treatment of blackwater (toilet wastewater) and organic household waste. A competition is organised where the specifications include the generation of energy and that no more than

0.5 l of water is allowed per flush. Another project in the town of Surahammar is to install grinders in the sink to allow for digestion of the organic waste in the digester at the sewage treatment plant.

The view on developing countries was also included with an example from Dar Es Salaam in Tanzania. Common also for other areas is the urgent need for sanitation, according to WHO three billion people lack sanitation. It is not possible to supply all these people with piped sewerage and therefore dry systems with urine-separation are recommended rather than conventional pit-latrines.

Discussion - Debate

The final discussion included statements such as:

- A change to alternative water and wastewater systems, or a complementary to the present system, is expensive. To motivate a change a price on the environment must be set.
- Who should be responsible for the individual systems? The municipalities themselves do not have the resources to do it.
- Urine separation is a technique mature enough to implement. Yes, there are still question marks regarding pharmaceutical compounds but that problem remains oavsett what system we choose. Blackwater systems will probably be enough investigated and developed for implementation on a large scale within 5-8 years.
- Pilot projects, also on a larger scale are needed to increase the concern about the environment. But if the environmental benefits are not large enough, then there is a risk for a backlash. For example the individual systems are not controlled but there are no incitements for the owner to do something about his system.
- Political support and means of control are needed to direct this development. The farmers do not have any problems to obtain fertilisers today, but they need to change beforehand and are very sensitive to medial forces, e.g. for health alarms.
- The demand for protecting recipients are still larger than the demand for closing the loops.