



Work package Nova 1

# Acceptance



## Research background

Nova 1 focuses on peoples' attitudes towards the NoMix technology. To date, new technologies have been developed by wastewater management experts without the participation of the public. However, wastewater separation in private bathrooms concerns every individual. Accordingly, both practitioners and users of NoMix toilets were involved at a very early stage of the Novaquatis research programme in order to determine how this innovation is viewed by the public.

Nova 1 involved scientific studies accompanying all the pilot projects in Switzerland. It identified the deficiencies of the NoMix technology and explored questions such as: Are NoMix toilets accepted? Is the design well received? Do the NoMix toilets smell unpleasant? Do users adapt their behaviour? How can the NoMix technology be diffused? What factors would promote the success of further NoMix pilot projects?

## Nova 1-1: Consumer attitudes

(Claudia Pahl-Wostl)

Initial data on the acceptability of NoMix toilets in households was provided by a citizen focus group study involving 44 volunteers [1]. The participants were introduced to the complexities of urine source separation with the aid of an interactive Web tool ([www.novaquatis.eawag.ch/tool/index\\_EN](http://www.novaquatis.eawag.ch/tool/index_EN)) and took part in moderated group discussions. In addition, they visited a NoMix toilet at Eawag.

The most important findings were that 79 % believe the NoMix toilet to be a good idea, and 84 % would move into an apartment fitted with a NoMix toilet – although the costs, maintenance and cleaning efforts required should not be significantly higher than for conventional toilets. Food produced with urine-based fertilizers would be bought by 72 %, provided that health risks are excluded.

Relatively little importance tends to be attached by the participants to sustainable development – e.g. closing of nutrient cycles. More important, in their view, is knowledge of any health risks associated with micropollutants in urine-based fertilizers. Consequently, efforts to minimize such risks are of the greatest

relevance in ensuring that the NoMix technology is accepted by consumers.

Many of these findings are confirmed by the quantitative surveys conducted for the pilot projects in public buildings. However, the qualitative results from Nova 1-2 and the pilot project in households indicate that having a NoMix toilet in a private bathroom is not, in practice, unproblematic.

## Nova 1-2: Cultural psychology

(Ruth Kaufmann-Hayoz, Kirsten Thiemann)

Nova 1-2 forms part of a doctoral thesis on sustainable product design [2]. On the basis of theoretical considerations and a case study, the relevance of technological innovations to well-being was investigated. As well as exploring historical, collective/cultural developments in the sanitation field and personal bathroom culture, the case study was concerned with the introduction of NoMix toilets at a vocational college and in four private apartments.

As shown by the theoretical investigations, it is difficult to introduce technological innovations that are not in conformity with human culture. One problematic aspect of this process is the sense of being subject to the will of others, e.g. if NoMix toilets are installed in an apartment without the tenants' explicit consent.

This experience in private apartments led to specific recommendations for the improvement and widespread acceptance of the NoMix toilet. The residents' reactions varied widely: some are sceptical, others approve of the NoMix toilet, particularly for environmental reasons, and are happy to use it. Usage of the NoMix toilet is heavily dependent on individual factors such as habits or ergonomics. While some men always sit to urinate, others never do so. The correct sitting position is difficult for many women and especially for children to adopt. The cleaning effort required is generally considered to be relatively large. In addition, it would be ideal if it were possible to select from a range of NoMix toilets with a variety of colours, designs, sitting positions and flushing systems.



Gentlemen, please be seated: The NoMix toilet only works if it's correctly used – but you're allowed to read the paper (Photo Ruedi Keller)



And, how was it? For 80 % of the users surveyed, the NoMix toilet is at least as good as conventional models (Photo Ruedi Keller)

### Nova 1-3: Acceptance and diffusion

*(Judit Lienert, Tove A. Larsen)*

Nova 1-3 used quantitative studies to assess the acceptance of the NoMix technology among larger target groups and investigated how it could be further diffused. Surveys were conducted for all three Swiss pilot projects in public buildings: at a vocational college (534 respondents), at Eawag (715) and at the Basel-Landschaft cantonal library (501). The results are representative for users of buildings of this kind (e.g. vocational college students in German-speaking Switzerland).

Acceptance levels were very high in all cases. Urine source separation was considered a good idea by 72 % of respondents at the vocational college and Eawag, and 86 % would move into an apartment fitted with a NoMix toilet [3, 4]. Around 80 % rated NoMix toilets as equivalent or superior to conventional toilets with regard to design, hygiene and odour. While the NoMix technology only works if the toilet is correctly used, most of the respondents were prepared to adapt their behaviour; for example, 72 % sat to urinate. These findings were confirmed by the survey at the BL cantonal library (not yet published).

Theoretically objective factors (e.g. odour) are often subjectively perceived in practice. Acceptance thus depends not only on clean sanitary facilities but also on information, discussions with peers and personal attitudes. Effective communication therefore has a decisive influence on project outcomes.

The NoMix technology is linked to the entire wastewater management system – from toilet to treatment plant. A high level of acceptance among toilet users in itself offers no guarantee that the innovation will be widely adopted in practice. What is crucial, rather, is to gain the support of wastewater professionals – as was shown by an analysis based on diffusion theory [5]. Urban wastewater management experts will have to introduce the new system and bear many of the consequences. Scientists, for their part, will need to provide mature solutions capable of winning the commitment of professionals to further develop the NoMix system in practice.

### Conclusions

The results from Nova 1 make it possible to assess how the Swiss public could react to the NoMix technology. It will probably be widely accepted if it meets modern sanitary standards and is safe and not too expensive. However, given the drawbacks of current NoMix toilets, large-scale implementation cannot yet be recommended; the toilets first need to be optimized by the sanitary firms (Nova 2). Our experience indicates that while further pilot projects are still possible with the immature technology, careful supporting measures will be required. Such projects are trickier in homes than in public buildings, where maintenance is performed by technical staff. As the next step, diffusion pathways for the NoMix technology should be investigated and market niches identified where it can be implemented and refined. The public is prepared to give this unconventional technology a chance.