

Research Project Sanitary Recycling Eschborn (SANIRESCH) Project component: Acceptance

1. Background

Acceptance identifies the attitude of a larger group of people towards a special technology without giving any special reasons for their opinion and behavior. Social acceptance of a new technology and its impact on society is a precondition for its successful and widespread implementation. Therefore, the SANIRESCH project included a user acceptance analysis. As the NoMix toilets have been installed in a part of the building of GIZ, the employees working there have been interviewed about their experiences with and opinion of the toilets. This way, it should become clear whether the users approve the idea of recycling urine and conserving water or not and show if the practical realisation succeeds in satisfying the user's expectations.

In a further study, potential users of the created fertiliser products were questioned. Farmers were asked regarding their attitudes towards the new recycling products - yellowwater and MAP - and if they were interested in applying those to their fields. Furthermore, consumers had to give their opinion on buying, eating and using agricultural products fertilised with these products.

2. Conducted surveys

About 400 employees have been asked to participate in the anonymous opinion survey for three times to analyse the development of acceptance during the project (with a regressive number of answers: 127, 67, 36 respectively). The questionnaires included a fixed part of questions for all participants, gender-specific questions and additionally variable ones according to the recent project developments.

For the farmers' study, 400 questionnaires were sent to all registered farmers and gardeners of the Landwirtschaftskammer in North-Rhine-Westfalia (NRW). For the consumer study, 500 consumers, randomly distributed in NRW received questionnaires. Of those, 100 returned questionnaires could be evaluated.

3. Results and discussion

3.1 Sanitary system

More females than males participated in the GIZ survey. The results of all three surveys show that the waterless urinals are well accepted. Regarding the utilisation and cleanliness, men rated the waterless urinals as *comparable* to conventional

urinals, while the smell of waterless urinals was rated as *gradually worse*.

Most people confronted with the NoMix toilets and not involved into the project before have the tendency to judge the NoMix toilets *worse* than others. During the project, the users did not only get a better knowledge of the technique but also indicated that it is necessary to get detailed information about this new toilet type and its usage. Within the third survey, all participants were able to answer questions concerning the usage of the NoMix toilets correctly. The users have a strong tendency to favour conventional toilets over NoMix toilets. Less than one quarter of all participants of the third survey indicated to prefer the NoMix toilets or not to have any preference.

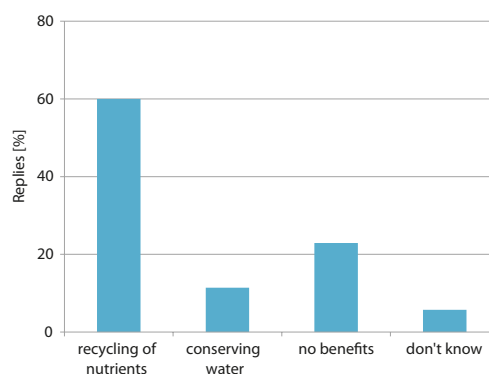


Figure 1: "In your opinion, what is the key benefit of the NoMix toilet?".

A reason for this may be seen in the technical and hygienic problems that occur when using the NoMix toilets. About 70% of all users indicated that they sometimes cannot flush the toilet as usual. More than 20% of the participants of the third survey had already experienced blocked toilets. Concerning hygienic problems, especially women indicated to be confronted with a dirty toilet bowl or seat as well as annoyance caused by bad smell when using the NoMix toilets. Most users judged the flush as not powerful enough. This is why about 65% of all users activate the ordinary flush at least two times for every usage. This may be a reason why many users do not consider the conservation of water as a benefit of the NoMix toilets. More than 30% of the participants rated the usage as *much worse* in comparison to conventional toilets. About 70% of the users think that the cleanliness is *worse* or *much worse* than of conventional toilets.

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The results show that the problem of dirtiness within the NoMix toilets is not the consequence of a lack of cleaning through the cleaning staff but of careless toilet use by the users themselves. As can be seen in Figure 1, the users' opinion about the NoMix toilet is divided. One part accepts it and thinks it is a good idea to conserve water and help the environment whereas the other part refuses the idea and judges it as a step backwards in development. Asked about the key benefit of NoMix toilets 60% answered *recycling of nutrients*. The users' interest in using the NoMix toilet at home is not high, but most people would accept inedible as well as edible products produced with reclaimed nutrients.

3.2 Fertiliser products

Anonymous answers of 27% of farmers could be evaluated. Of those, 95% were male, most of them between 40-60 years old (73%). Their farm sizes usually ranged between 50-100 ha (43%) and 100-200 ha (25%). The third group with 15% owning 0-10 ha consisted mainly of gardeners. Besides a number of background questions on farm management, environment and preferences, farmers gave their attitude regarding two products: a liquid fertiliser (urine from a sanitary system) and a composed solid powder fertiliser based on urine. Farmers and gardeners were aware of the fact that urine contains quite a lot of nutrients (62% yes to 10% no, 28% did not answer the question).

Most of them were quite open towards a urine based fertiliser. Two thirds of the farmers assessed the idea as interesting and 52% would generally want to use this kind of fertiliser. Another 35% would eventually, and only 14% would generally not want to use these fertilisers. The majority of farmers would accept urine and urine based fertilisers for cereals (91% and 81%, respectively), and one third would even accept those for vegetables. The farmers would also consume cereals (90%) and vegetables (40%) fertilised with urine and urine based fertilisers. Regarding health risks, 32% assessed urine potentially imperiling to health whereas 47% did not esteem it as dangerous.

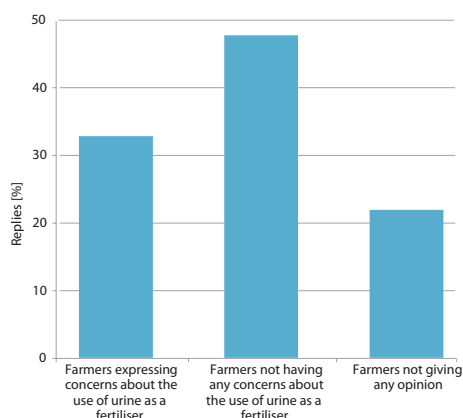


Figure 2: „Do you have any concern regarding the use urine-based fertiliser?“

Around half of the farmers regarded urine as safe, the other half as dangerous; however, three quarters think that its use is controllable.

Nearly two thirds (57%) were not concerned about its use; the doubts expressed by the other third (34%) comprised safety, pharmaceutical residues and consumer acceptance.

4. Conclusions

In general, the idea of the project is appreciated. Due to occurring technical and hygienic problems with the NoMix toilets, people do not want to implement toilets of the current design in their own environment. Farmers were quite interested to apply the new products especially when safety and consumer acceptance can be assured. Consumers as well, accepted to a great extent goods produced with recycled nutrients. From the results of the surveys it can be concluded that users should get involved into the innovations very early and should be informed about the usage and implementation objectives of NoMix toilets as well as about fertiliser use in order to improve the overall acceptance of NoMix toilets and their products.

5. Acknowledgments

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