From P(ee) to P(hosphorus)
A Communication Approach for Sustainable Sanitation

S. Hörnlein, S. Mehling, J. Londong
Chair of Urban Water Management and Sanitation, Bauhaus-Universität Weimar, Germany

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MOTIVATION

The user acceptance for source-separation-based sanitation systems is crucial for their implementation. There is a strong correlation between the level of knowledge about a new technology and its acceptance.

As part of the interdisciplinary project Phosphorus-Bank the communication platform „P-BANK" for the exhibition and interactive information on the topic of resource-oriented sanitation (ROS) was developed (Figure 1).

Based on a toilet in the public space, the focus is on the actual use of the toilets and the surrounding nutrient cycle. The central object of the communication is the macro nutrient phosphorus. The symbolic effect is supported by the ambiguity of the sound of the chemical symbol "P" for phosphorus in connection with urinating (to pee). This methodology of shortening messages (Figure 3) supports the transfer of information and knowledge.

The P-BANK combines the technical implementation of ROS with aesthetic design components as a newly designed toilet concept to present ROS as an alternative to conventional sewage systems.

A wide range of identification possibilities with interfaces concerning urine disposal and resource recovery are offered. By focussing on nutrient recycling from urine or yellow water (Figure 2), an excerpt from the transformation potential of wastewater disposal is conveyed in an exemplary manner.

Figure 1: The communication platform „P-BANK" (100th anniversary of the Bauhaus, Weimar)

METHODOLOGY

The transformation of the toilet user into a nutrient donor is at the core of the communication concept. The toilet cabins are labelled donor rooms (Figure 4) and include the no-mix toilet save! (designed by EOOS, Vienna) and a waterless urinal. As an active participant in the phosphorus cycle, the visitor goes through the cycle stations of urine collection, urine processing (Figure 5) into fertiliser and the actual fertiliser use in the raised beds (Figure 6). The fundamental concept of the P-Bank design is based on modularity, so that both sanitary installations and treatment processes can be exchanged. This enables the flexible testing of different combinations. The demonstrator includes a two-line treatment process. Line 1 consists of the process combination of ammonia stripping, acid gas scrubbing and phosphate crystallisation on growth surfaces. In line 2, the urine passes through an alkalisation process followed by an evaporation unit.

On his way through the facility, the user is accompanied by visualised explanations of the technologies in relation to particular stations of the P-BANK (Figure 3). After completing the P cycle, the P donor receives a sample of the human urine fertiliser AURIN from Vuna GmbH (Switzerland) with a specially designed P-BANK label as a thank you (Figure 7).

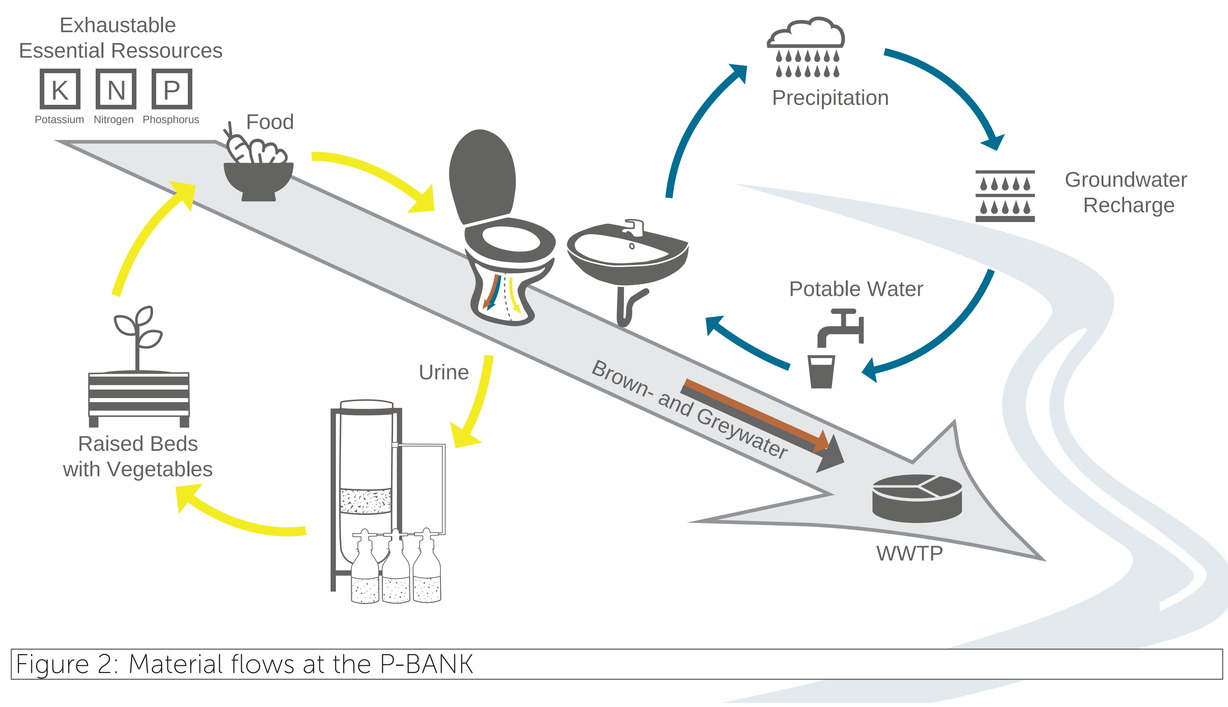

Figure 2: Material flows at the P-BANK

RESULTS

The system was operated for four months on the campus of the Bauhaus-Universität Weimar during the celebrations of the 100th anniversary of the Bauhaus. Based on sample counts on 7 non-contiguous days, the number of users of the P-BANK during this first test period was approximately 4,700. A combination of quantitative and qualitative analyses (n=55) was used to evaluate the effectiveness of the communication. The visit to P-BANK was rated as a very positive, hygienic and comfortable experience. The good comprehensibility of the content shown was confirmed by the users.

In the future, the mobile unit will serve as an information and evaluation platform for alternative sanitation systems at other recycling sites. The P-BANK can be rented for information campaigns on other treatment methods for separately collected faeces or urine.

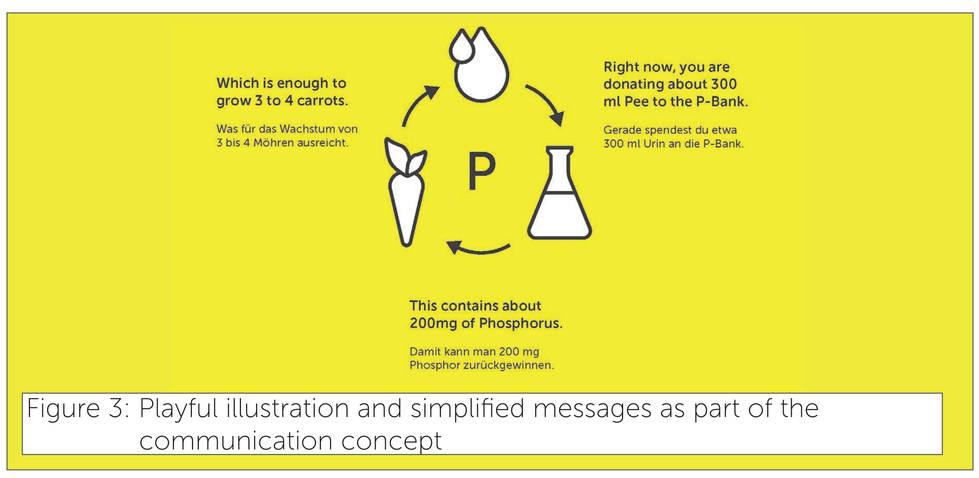

Figure 3: Playful illustration and simplified messages as part of the communication concept

Figure 4: Donor room 1 with no-mix toilet


Figure 5: Permanent insight into live urine treatment optimised for comprehensibility

Figure 6: Nutrient reuse in raised beds

Figure 7: AURIN fertiliser with P-BANK design

Coordination

Projekt Partners

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