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Saving (on) Water. Living in Eco-San Communities in Germany

This case study explores how decentralised sewage infrastructures (also referred to as Ecological Sanitation) change the city. These vernacular or high-tech eco-innovations in several urban building communities in Germany save water by recycling and reusing waste water and were installed as a critique of resource depletion and the wastefulness of urban life. This presentation focuses on two aspects of alternative sewage systems. Firstly, it shows how the conventional way of perceiving sewage in the city is radically altered as ecological sanitation (eco san) plays an important part in the everyday life of its users. Secondly, as localised eco-san technologies require a disconnection from the public sewage system, they pose important questions regarding the question of environmental justice and urban welfare.

The conventional water infrastructure system and its critiques

Centralised water provision and sewage systems were installed in German cities starting in the late 19th century and designed as a public health protection systems against waterborne diseases and cholera outbreaks in rapidly growing and industrialising cities, leading to considerable decline in mortality rates in the city (Van Laak, 2001; Rodger/ Massard-Guilbaud, 2011). Today, 99% people living in Germany are connected to the municipal water provision, and 93% are connected to the municipal sewage system. This high connection number is enforced with a national obligatory-connection policy (*Anschluss und Benutzerzwang)* enabling universal connection for all urban dwellers land ensuring economies of scale in urban water provision and sewage disposal. Access to water and disposal of sewage in Germany is said to be taken-for-granted by the user, leading to the much cited thesis that infrastructural provision only becomes a ‘matter of concern’ once it is disrupted or stops functioning (vgl. Star, 1999; Graham and Marvin, 2001). Despite its smooth functioning for most users, this system has lead to mounting critiques. Engineering and ecological commentators frequently criticize the systems grade of centralisation, high energy consumption, high maintenance costs, and loss of nutrients contained in waste water and the consequent failure to adapt flexibly to contemporary challenges such as climate change, demographic change, fiscal austerity, etc; (Kluge/ Libbe 2010; Hoyer et al, 2011). At the same time social and

political scientist draw critical attention to the municipal dominance and top down organisation in urban water provision, the universalist ideal that is inherent in the centralised provision but which is a myth globally, particularly in rapidly growing cities of the global South and the system's dependency on expert led approaches based on a civil engineering/urban planning mind set that does not easily accommodate expanded public participation (Gandy, 2006; Graham/Marvin, 2011)

Alternative Sewage Systems

There are a number of hightech and vernacular innovations in the water and sewage sector that address the above mentioned critiques. In this presentation, we will introduce a number of urban building communities that have build their own sewage system for waste water treatment. Each house in the respective housing community is featured with a special compost toilet ('dry toilet') that looks like and is used like a conventional toilet. It is different as it does not require any fresh water for flushing and collects human waste in the basement where it turns into compost/fertilizer used for gardening (Image 1). The constructed wetland in the centre of the housing arrangement treats the remaining wastewater from kitchen and bathroom by leading it through a reed bed into the adjourning stream or groundwater (Image 2).

While the conventional flush toilet requires up to 33l of fresh drinking water per person per day - about 27% of the daily personal water consumption -, the 'dry toilet' functions entirely without water. This amounts to a water saving capacity of about 12 m3 per year per person, equal to approx. 1.200 buckets of water. As the constructed wetland catches the remaining wastewater – no sewage enters the urban pipe system. This saves about XX m3 waste water per household per year compared to the household connected to the conventional system. The extended effect of saving wastewater is that the public sewage system – the highest energy consumer in the city - requires less energy and water to transport sewage to the waste plant via the pipe network. Thus, vernacular eco san saves water in two ways: it requires no fresh water for toilet flushing and it recycles - and thereby redefine the meaning of useless - 'waste'(water) by using a low-energy, organic mechanism .

Changing the meaning of sewage in everyday life

Eco-San requires its users to attend to the operation of sewage disposal in the city in a much different manner. It not only requires a joint decision for to the installation of the technology and a political and administrative struggle to be exempted from the compulsory connection policy (*Anschluss- and Benutzerzwang)*, it also needs to be cleaned, maintained and organised on a permanent basis by the users itself. Much different than the conventional sewage system whose operations and functionalities, pipes and filters, quantities of energy and water consumption remain invisible, or 'transparent', to the user (Star, 1999; Beck, 2012), the eco san technology opens the 'blackbox' and becomes an active part of the users everyday life. When new visitors want to use their bathroom, they have to be introduced to the absent button for flushing, and it often becomes a topic of conversation. Visitors are surprised that the toilet does not smell, they are reminded of their grandmothers pit latrine and it stimulates a discussion on water scarcity and the best ways to save it. Moreover, the distinction between user/provider and user/expert collapses as there are no experts other than its users in charge of the technology.

The conventional toilet is organised under the principle *Out of sight - out of mind* in a double sense. Administratively and technologically, it delegates the management of the system
into the hands of the expert, the civil engineer and municipal management, which - according to urban historial Moss - creates a relationship of distance between user and provider that is top down and mediated only through the monthly or annual bill (Moss, 2001: 6). Physically, human waste disappears underground in a large, complex and inaccessible sewage system. Urban sewage is considered as the ultimate abject, the urban 'uncanny' that despite its mundaneness is considered as strange, disturbing and nauseating (cf. Beyes/Steyert, 2013). Urban geographer Matthew Gandy sees this system indicative and co-constructive of what he calls the 'atomiziation' of social life under modernity, the 'fear of touching' and the withdrawal from intimacy or curiosity towards strangers (Gandy, 1999: 35; Gandy, 2006: 20). In contrast, the dry toilet and constructed wetland reduces the complexity of sewage disposal because of its small scale and vernacular approach. The eco san technology breaks with conventions of practice by creating a community around the technology, reskilling its users for its maintenance and introducing new discourses to urban dwellers. As it becomes a 'matter of concern' in the everyday life of its users, sewage changes its meaning. With eco-san technology sewage is

not considered waste, it is an object of material (as fertiliser) and symbolic value (as educative object for sustainable living) that changes the way users think about their own water consumption and possibilities to reduce it.

Urban welfare and enviromental justice in the city

In contrast to principle of scale that enables the functioning of the public sewage system, eco san functions under the premise of locality – an urban paradigm that is central in degrowth and sustainability discourses. Whereas the eco san community contributes to a reduction of high amounts of energy needed to transport and treat wastewater in the public system, it also threatens the ideal of public welfare expressed in the public system and which is enabled by a monopolised economy of scale (Rodger/ Massard-Guilbaud, 2011). People living in eco-communities have built an enduring, autonomous, collective community around their sewage infrastructure as a critique of resource intensive metropolitan lifestyle. At the same time, the desire to be independent and autonomous challenges the municipal public system. Ecosan technologies shift the responsibility for sewage disposal to the local and community level. This raises broader urban development questions in regard to a splintering or fragmented urbanism (Graham and Marvin, 2001). Hodson and Marvin point to the development of what they call ‚premium ecological enclaves' in the city that by-pass existing infrastructure systems to build internalised ecological resource flows that attempt to guarantee protection through autonomy. Such spaces are removing themselves from wider notions of social and geographic cross-subsidy that risks to create growing inequalities in the urban landscape, between those spaces and the people that are able to access and afford them and those who are excluded (Hodson and Marvin, 2011: 365). Shifting the risk from national/statist organisation to communal organisation and collective entrepreneurship also threatens the long-established principle of mutuality and cross-subsidy of the welfare state inherent of many centralised urban infrastructures. If this is so, it raises difficult issues as to what is left for those outside of these privileged urban territories.

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