Activity Report Research Stay Berlin March 2016

1) Berliner Str. 88

- **Visit**: 7th March 2016, 10:00-12:30
- **Discussion**: 15:00-18:00
- **Hosts**: Jennifer Loll, Arie Shulov, Karl Maurer
- **Attendants**: Dr. Lina Suleiman, Laura Palau, Natàlia García (Dr. Timothy Moss in discussion)
- **Activities**: walk around the settlement, accompanying explanation of the rainwater/ stormwater management system (pond, stream, cisterns, pumps, fountain, greening of public space and private/rental gardens). Information and insights on the neighbors' association and the community hall, as well as organized activities. Visit Mühlenau Grundschule (primary school linked to the association) and group conversation with children living in the settlement or attending the youth/ childhood club activities about the rainwater and stormater system (own perceptions, knowledge- awareness of existence, problems, satisfaction, wishes- expectations)
- **Brief description of the Berliner Str. 88**:
  - Tender process 1987-1988, construction 1990-1994 (buildings), 1997 (completion of exterior facilities, incl. green spaces, water stream and pond)
  -32166m^2 site area, previously it was a tree nursery
  -171 residential units, approx. 500 residents
  -Publicly financed pilot project on "ecological construction/ building", framed within the Federal Program EXWOST- Experimental Housing and Urban Development/ Construction (297.000,00 DM = 151.853,68 €) and within State Program "Urban, Ecological Pilot Projects" (Stadtökologische Modellvorhaben) (113.000,00 DM = 57.775,98 €)
  -Additionally, the residential buildings got supported by Social Housing Promotion (WFB 1990) because they fulfilled required ecological features (e.g. energy saving construction, use of environmentally friendly materials, rainwater collection, waste separation, etc.)
  -Between 1992 and 1997 was accompanied by research carried out by Complan, Gesellschaft für kommunale Planung und Stadtentwicklung mbH
  -3 housing companies involved (GSW- nowadays Deutsche Wohnen, BWV, and BBG) each owns an area and the corresponding housing blocks and RW collection cisterns. Initially all of them were public, currently GSW private
  -District owns public spaces (where the water stream is located), within the district two departments involved: green spaces and structural engineering
  -Neighbours created an Association in 1994 and decided to use the house at the pond as "community hall". The Association and neighbours have been very actively involved, engaged in the maintenance of the facilities
  -Experienced problems with ecological components of the settlement (e.g. wind mill never working because of lacking budget for batteries, PV modules on the community hall broke due to vandalism and were removed)
  -Components of the storm- and rainwater management system: rainwater collection from roofs in cisterns (with filter layer to pre-treat water before cisterns which have 150m^3 and 250m^3 capacity), collected water used for watering of gardens (after being filtrated and its pressure increased), if there is a surplus of collected rainwater it is directed to public

green axis ending at the water stream and water pond (both sealed with clay) to keep them functioning. A planted soil/sand filter before the pond to clean water; the pond has an outlet to a groundwater recharge "facility" (filtering well/ duct, 2 percolation tanks (3,5m diameter and 4m deep) and a ditch /1m x 1,5m x 58m)) and a pumped connection to the public sewer for discharge in case of overflow of the pond. At the beginning of the water stream there is a fountain (turned off in winter)

- Functioning problems appearing in the last years. For example, the pond had to be filled twice with drinking water because of insufficient water levels. Once done by firework and once by the Berliner Water Utility (the Association carried the costs of the latter refill)

- **Main impressions about the case study**:

- Clear top-down project, with "bureaucratic approach", public funding was fundamental
- Lacking long-term thinking + reflection (ideal, shortsighted goal to have such kind of project but not well reflected, especially in terms of long-term maintenance and good functioning of the system)
- Storm- and rainwater do not seem to have been central concern/ issue motivating the settlement and system. Handling rainwater issues was no direct motivation to implement this project
- Maintenance issue → problems (e.g. blocked pipes connecting cistern to RW stream from GSW building decreasing water being fed into the stream, at the same time problems with wet cellars requiring water to be pumped out)
- Maintenance is defined differently by the involved actors
- Responsibility and agency issues:
  - Engagement of neighbors/ residents + club/ association central role; special engagement from old residents
  - Connection public – private space (no boundaries between private and public space in the settlement → lacking responsibility sense from people from outside may be causing problems with dogs, waste, vandalism, etc.)
  - Differing role, engagement and interest from the housing companies – "collapse" of system as consequence of lacking maintenance; private housing company identified as least interested in facilities
  - "Unclear ownership"
- Very clear social component of the project. The system offers more clearly social added value than technical and environmental. Storm- and rainwater are being linked to other aspects, framed differently than initially thought

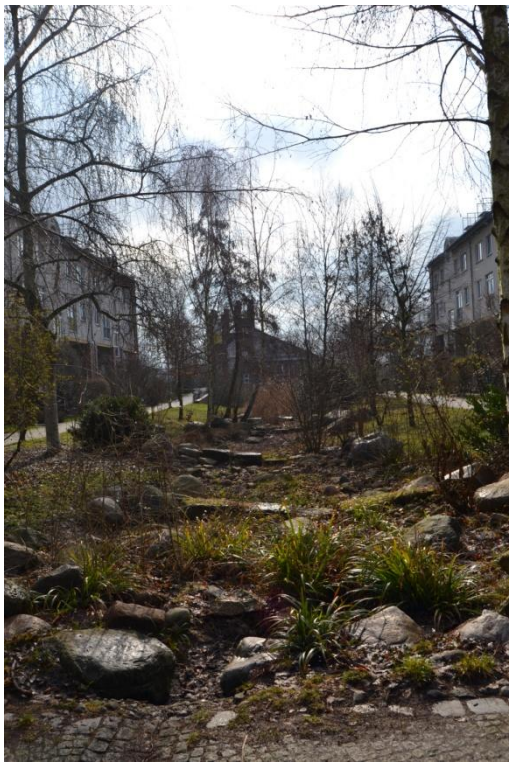
- **Pictures:**

Pic. 1 Karl Maurer, Laura Palau, Lina Suleiman, Jennifer Loll and Arie Shulov; (from left to right) Author: Natàlia García

Pic. 2 Settlement entrance- Berliner Str.;
Author: Laura Palau

Pic. 3 Fountain and upper part of the water stream;
Author: Natàlia García

Pic. 4 Upper half of water stream; Author: Natàlia García



Pic. 5 Lower half of water stream; Author: Natàlia García

Pic. 6 Rainwater pond and community hall;
Author: Lina Suleiman

2) Sonnig Wonnig e.V., Wönnichstr. 103

- **Visit**: 8th March 2016, 09:30-12:00
- **Discussion**: 13:40-15:30
- **Host**: Dr. Ferdinand Beetstra
- **Attendants**: Dr. Timothy Moss, Dr. Lina Suleiman, Laura Palau, Natàlia García
- **Activities**: personal introduction (team members and host), explanation of technical facilities, round of questions from attendants, resulting explanation on the organization of the community and group, on the 2 main ownership approaches for such projects; visit garden, cellar, shared spaces of the community in the building (library and activity room), all accompanied by explanations from the host and questions from the attendants
- **Brief description of the Sonnig Wonnig e.V.**:

- Building from 1913, environmentally friendly refurbishment 2000-2001
- 1050m^2 site area, each floor is approx. 170m^2 and there are 3 floors, ground and top floor (used as common space and/or offices)
- Approx. 20 residents (among them 5 children)
-Financing was 50% own capital and 50% external (e.g. funding from the State program "Social City Renewal", German Federal Foundation for Environment, DBU)
- Initiators aimed at proving that ecological, economic and social goals can be achieved at once. Reduction of drinking water consumption and wastewater discharge, use of grey- and rainwater to close water cycles, save energy, use renewable energy sources, use environmentally and health friendly materials, build local cycles between garden and building/house, achieve natural areas in urban property, etc.
- The initial group of actors was the core/ engine of the project but counted with support of an engineering consultancy (AKUT) (project management and implementation), consultancy supervising/ accompanying the application for funding, etc.
-The residents of the building are its owners, and are organized in an association. This modality protects speculation and guarantees decision-making and influence capacity of the residents. To become owners the residents pay 5000€, which they get back when they move out. The community uses plenum meetings to discuss important issues and is organized in working groups. The selection and moving in processes are regulated and made as transparent as possible
-The rainwater management system is combined with greywater re-use system. The water from the roof and balconies is collected in cisterns. Two pipes are used for this and have a filter incorporated to pre-clean it, the surplus is led to unsealed garden where it can infiltrate. In the garden, there is a pond. Rainwater is also led through a vertical planted filter before conducting it to the tanks in the cellar. There it is cleaned to be able to use it for toilette flushing and washing machine. For the greywater additional treatment steps and filtering are in place. In addition to that, 1l toilets have been installed (they are not to be found anymore, they were bought directly from a Scandinavian company, which was acquired by Villeroy and Boch, since then the production of 1l toilets has been suspended)
-Maintenance is carried out by the residents

- **Main impressions about the case study**:

- Bottom-up project
- Thoroughly planned and coherently implemented

- Rainwater management as one component of the system, coherent to the principle and goals that were sought, but as such not a cornerstone (kind of “natural consequence” of initiators’ values and goals), importance of combining it with greywater to create/ close the cycle
- Agency has great importance and role
- It has a “bubble character”, it is independent from its context, it could have been implemented exactly in the same way somewhere else (it was not consequence of specific water issues in Berlin, to try to handle them, but as part of ecological and social way of living). They aimed at “creating a better place to live”, their own, isolated from the city’s infrastructure BUT
- It is a reflection/ representation of social movement and initiatives ongoing in Berlin
- Social dimension was a big driver of the project and also very important for its functioning (the practical implementation of the project has evolved in parallel and been influenced by the residents, its needs and preferences, which were not known at the beginning)
- The organization of the group is very special, the group acts as one unit
- In relation to the selection process of residents, the group looks for complementary residents. The profile is defined by the group (what misses social wise, e.g. elderly, or socially weak family, etc.), “bring social-communicative and environmentally aware” are the base
- The internally available expertise, resources, passion and commitment have been central for the project’s success
- Within 14 years already paid off (the size of the building, users, and the combination of rainwater and greywater were fundamental for the economical feasibility and performance of the system)
- Sharing and distributing costs is central, also for amortization, (e.g. by sharing devices like washing machines, connection to internet, etc.)
- It is an example for retrofitting. Dr. Beetstra underlined the importance of considering this kind of system from the very beginning to be able to implement it without bigger obstacles; they had an empty building (made it easier). It is very difficult to add such system later on
- It is not easy to replicate

- **Pictures:**

Pic. 7 RW pipe into the cellar; Author: Laura Palau

Pic. 8 RW collection from balconies directed into the cellar; Author: Natàlia García

Pic. 9 RW collecting pipes with incorporated filter; Author: Laura Palau

Pic. 10 Green roofed bike rack and vertical planted filter; Author: Natàlia García

Pic. 11 Unsealed garden and pond; Author: Natàlia García

3) IKEA Lichtenberg

- **Visit**: 9th March 2016, 10:00-14:00
- **Discussion**: 15:00-17:00
- **Host**: Thomas Gibalowski (technical facilities IKEA Lichtenberg) and Mr. Jensen (technology, Construction Dpt. IKEA Germany)
- **Attendants**: Dr. Timothy Moss, Dr. Lina Suleiman, Laura Palau, Natàlia García
- **Activities**: explanation of all technologies implemented in the store in Lichtenberg, description of the facilities, its "history", information on IKEA philosophy and goals, round of questions, exhibition and explanation of the store's miniature model where all environmentally friendly technologies can be lighted up. Visit facilities in the "cellar" (fire hydrance system, rainwater collection tank) and on the roof (photovoltaic and solar panels, rainwater collection "entrance")
  (This visit was in German, thus Dr. Moss or Natàlia García tried to translate it as good and fast as possible to Dr. Suleiman and Laura Palau)
- **Brief description of the IKEA Lichtenberg**:

- Construction 2011
- Located at a newly developed industrial area branded with the name "Berlin Eastside" (the biggest in Berlin with 1200ha, public-private-partnership run project to attract companies)
- IKEA decides about the environmental technologies implemented in each newly developed store on the case basis, there is not a general, standard package of technologies included (it depends on the characteristics of the site, the city, available infrastructure, etc.). Each new project has to be presented and justified by IKEA Germany to the Swedish headquarter in order to get it approved and obtain funding
- Own capital covered the costs, and a small amount (quantity unknown) of federal public funding was given to the company for installing the wastewater heat recovery system (Sigmar Gabriel was Minister for Environment, visited the facilities with the Berliner Senator for Construction and "decided to provide" some funding)
- Focus of the environmental technologies in the store in Lichtenberg lies on energy, reducing CO2 emissions to half, but it was conceived as one of the biggest and most environmentally friendly stores in Europe. It is the first/ only store in Germany with all 4 technologies
- Photovoltaic (7450 panels) and solar modules ($50m^2$) are installed on the roof, additionally, wastewater is used for heating in winter and cooling in summer using a heat exchange system. Initially it was planned to use district heating but the prices offered by the company were not competitive, thus an alternative was searched. Since there was a sewerage plant in the vicinity of the store, an alternative using this opportunity was considered. It was very welcome by the Berliner Water Utility and the Authorities
- Rainwater is collected from the roof by inlets applying a simple pressure difference system (pipe is broader on the top and narrower as it comes down, closer to the tank) and directed to a $450m^3$ concrete tank; in case of being too high, rainwater is collected by "overflow" inlets, which lead it to the façade and is discharged into the parking lot. Rainwater collected, once filtered is used for toilet flushing. At the beginning some issues with algae in the tank were observed, but they improved without having to do anything. Before entering the tank rainwater is filtered at a coarse filter with several layers, then is again filter to eliminate particulates and directed to a temporary storage. Rainwater levels in the tank are controlled once a week, in the last controls it was not enough. When that is the case, drinking water is

automatically used to fill toilet flushing system. In case of overflow of the rainwater tank, there is a connection to the public canalization (not used so far). On the visit's date (9th March 2016) the tank was filled up to 20%. The full tank provides enough water for toilet flushing during 3 weeks. The rainwater is also used to water the plants in the store's glasshouse
- Maintenance and cleaning of the roof once a year; tank cleaned every 2 years
- Amortization time considered by the company when considering the incorporation of innovative, environmentally friendly technologies is 7 years
- The project has an exemplary character (used for publicity by the engineering consultancy, the Berliner Water Utility and by IKEA)
- They have approx. 10-12 visit/ year

- **Main impressions about the case study**:

- It is a one-of-a-kind project
- Commercial focus (green as part of reputation and image, having to be quickly paid off, focus on attracting as many customers as possible and keeping them as long as possible in the store, etc.) → focus on economical considerations, comfort and attraction of customers
- Rainwater as a resource to save money, costs (50% of drinking water being saved thanks to the system), but with an "add on" character, it was not a cornerstone of the project (this was energy focus and especially the wastewater heat recovery system)
- The company carries out a very complete an extensive monitoring of the facilities with the goal of finding underperforming spots, they collect and evaluate the specific data
- Focus on security
- Short amortization time
- Environmentally friendly technologies as branding strategy (also manifested through collaboration with environment protection organizations like NABU to work on species conservation, Greenpeace sponsoring, etc.)
- Project did not appear to solve and cope with local concerns and problematic issues regarding storm- and rainwater, it appeared as an "experiment" with isolated character from the city's concerns; however, has a strong connection to the site/ area where it is located (IKEA is one of the core partners of the "Berlin Eastside")
- Company aims at being a front-runner, being ahead of other companies in future relevant issues (e.g. electric cars)
- IKEA Sweden gives strategic directions when it comes to innovation and environmental protection (e.g. lately giving more importance to water matters) BUT in practice they have great freedom to propose and focus on what they think it might be more relevant
- Among IKEA stores a "global learning" takes place

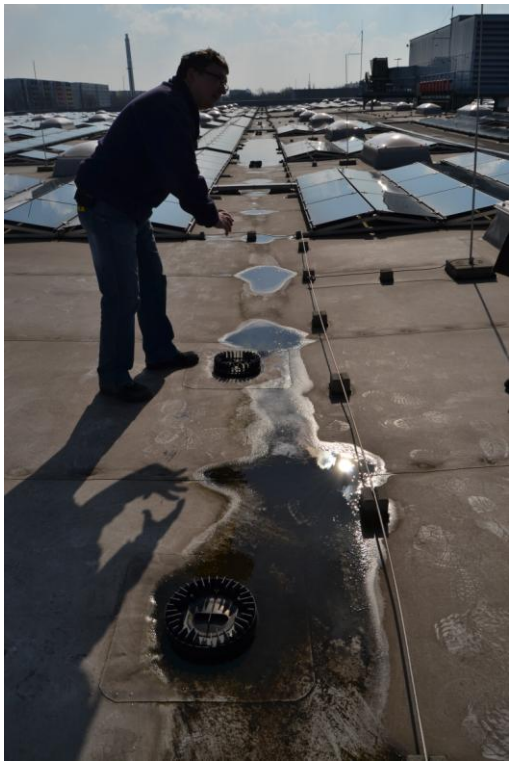
- **Aspects to be further assessed:**

  *Importance of RW fees? → Is the parking lot permeable and therefore just partially calculated for the fees?
  *Role/ importance of the industrial area "Berlin Eastside"
  *Role of the district
  *Is there in the other IKEAs in Berlin similar technology (rel. to RWH)?
  * Are there environmentally friendly technologies in the IKEAs in Barcelona and Stockholm? Which ones?

- **Pictures:**

Pic. 12 View from the roof, photovoltaic modules; Author: Lina Suleiman

Pic. 15 View from the roof, photovoltaic modules; Author: Laura Palau



Pic. 16 Thomas Gibalowski and roof rainwater collection inlets; Author: Laura Palau

Pic. 14 Roof rainwater collection inlet; Author: Lina Suleiman

Pic. 13 Roof rainwater collection overflow inlet; Author: Lina Suleiman

Pic. 18 Clockwise, Mr. Jensen, Dr. Moss, Dr. Suleiman, Natàlia García and Thomas Gibalowski in the water system operations cellar; Author: Laura Palau

Pic. 17 Water filters; Author: Lina Suleiman

Pic. 19 Rainwater tank; Author: Laura Palau

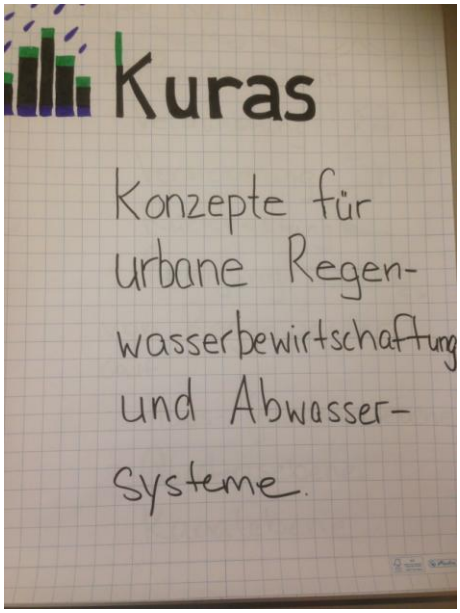
4) Meeting with KURAS

- **Meeting**: 10th March 2016, 09:30-12:00 at DIfU (German Institute for Urbanism)
- **Host**: Dr. Darla Nickel (DifU) and Dr. Andreas Matzinger (KompetenzZentrum Wasser Berlin)
- **Attendants**: Dr. Lina Suleiman, Laura Palau, Natàlia García
- **Activities:**

- Presentation of KURAS Project (by Dr. Nickel):
    - Initiative to launch project came from Senate (rel. to StEP-Klima)
    - Runs until October 2016 (officially until May 2016)
    - Main concerns in Berlin: CSO-surface water quality, heat island effect
    - Project has succeeded in bringing stakeholders together and supporting their cooperation (involved researchers, planners, BWB, senate actors, etc.)
    - Impact-based assessment and approach
    - Different levels/ dimensions of measures (building, quarter, drainage area)
    - Different technical solutions, development of packages/ combinations of diverse technical solutions
    - 2 pilot areas (each 1km^2)
    - Implementation in retrofit way more difficult than in new development (potential in Pankow due to boom expected in the district)
    - Benefits-impacts measured and quantified (biodiversity, quality of open spaces, climate, etc.) If not quantifiable, assessed as "Option A improves the quality of open spaces more than Option B"
    - Regulation as key factor to push implementation ("if we were required to do it, we would do it") top-down appears to be more effective; funding also appears to be effective. For retrofit measures other/ more tools to incentivate bottom-up solutions may be required
    - Goal was not to implement plans, but generate information on the effects of measures
    - As result of the process within project among actors' approaches, options and discussions, current focus on connection/ linkage between semi- and decentralized solutions and the underground sewer system. How can these solutions contribute to handle issues and concerns, alleviate problems affecting the sewer system?
- Presentation of UrbanRain and Stockholm case studies (Dr. Lina Suleiman)
- Presentation of Barcelona case studies (Laura Palau and Natàlia García)
- Presentation of Berlin case studies (Natàlia García)
- Discussion on Berlin (e.g. importance of Land Use Plans – districts, Tariff Splitting, of flexible instruments, not bound to a technical solution but to a goal, storm- and rainwater seem to be gaining political attention at the State Parliament, among others)

- **Pictures:**

Pic. 20 Information screen at DIfU; Author: Lina Suleiman



Pic. 21 Flipchart front page- Project title; Author: Lina Suleiman

Pic. 22 Dr. Nickel and Dr. Matzinger during discussion; Author: Lina Suleiman