

Press release

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Sustainable handling of rainwater and urban wastewater: software plans and optimises drainage systems automatically

To collect rainwater and wastewater, Germany has a well-developed infrastructure with sewer networks and sewage treatment plants. The situation is different in developing countries, where this is often lacking. A start-up from the University Kaiserslautern-Landau wants to remedy this situation. It offers its "ZIGGURAT" software for this purpose, which can automatically plan and optimise drainage systems sustainably. The technology also takes into account the blue-green infrastructure, i.e. possible water storage and technical measures for infiltration and evaporation of rainwater. The founders are funded with an EXIST grant from the Federal Ministry of Economics and Climate Protection.

Slums in which corrugated iron huts stand close together, with piles of rubbish and stagnant sewage right next to them - such conditions exist in many areas of the world. Around half of the world's population still lives without a sewerage system and new urban areas are constantly being built without proper drainage. In its Sustainable Development Goals, the United Nations has set itself the goal of providing access to clean water and sanitation for all. To achieve this, however, a corresponding infrastructure is needed.

However, the planning of such sewer networks for wastewater, rainwater or combined sewage is complex and requires a great deal of expertise. "Various parameters play a role, such as layout, the degree of de- or centralisation, sewer diameters and gradient, laying depths, pumping and storage facilities," says Timo Dilly from the founding team. Dilly's team in Kaiserslautern is currently developing software that can be used to automatically plan urban drainage systems in a sustainable manner. "It is based, among other things, on linking a large number of generally applicable technical rules of civil engineering planning and mathematical methods that can be used to generate sensible solution variants," Dilly continues. "We have developed our own algorithms for this. All this is based on current findings from our own research in urban drainage and hydroinformatics."

Climate change also plays a role in the planning of such drainage systems, as Dilly explains: "Dealing with rainwater has to be completely rethought when you consider increasing weather extremes. We need ways to store rainwater, but also natural elements such as sufficient green spaces. This can improve the urban climate in hot summer months." In this context, people also talk about blue-green infrastructure, which plays an increasingly important role in the planning of new urban drainage systems and is also planned for at ZIGGURAT. "With these measures, cities increase resilience to extremes, lower costs and reduce negative impacts on the environment," Dilly emphasises. In this respect, the software is also suitable for local cities and municipalities that want to adapt their drainage systems in the future.

Involved in the young company besides Dilly are his colleagues Dr. Amin E. Bakhshipour, Professor Dr Ulrich Dittmer and Ralf Habermehl from the Department of Urban Water Management at University Kaiserslautern-Landau. They are supported by Marius Lauer, who contributes business management knowledge.

In future, they would like to make their software ZIGGURAT available on an online platform where interested parties can create an account for a fee. In addition to the software, the team from Kaiserslautern also provides their expertise and offers support in planning, for example.

On its way to independence, the company is supported by an "EXIST-Gründerstipendium" from the Federal Ministry of Economics and Climate Protection and the European Social Fund for "Business Start-ups from Science".

More at ziggurat.ai

Questions answered:

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ZIGGURAT founding team presents software for automatic sewer network planning; Sustainable Water Infrastructure Solutions (from left to right): Timo C. Dilly, Ralf Habermehl, Dr.-Ing. Amin E. Bakhshipour, Prof. Dr.-Ing. Ulrich Dittmer
Credit: RPTU/View, Voss
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ZIGGURAT founding team in front of a storm drain outlet. Sustainable Water Infrastructure Solutions; from left to right: Ralf Habermehl, Prof. Dr.-Ing. Ulrich Dittmer, Timo C. Dilly, Dr.-Ing. Amin E. Bakhshipour, Marius Lauer.
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