

Smart urban drainage system in Zadar implemented

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Summary

1. Introduction	3
2. Smart urban drainage system in Zadar	4
2.1. Smart Urban Drainage System in Park Vruljica.....	4
2.2. Smart Urban Drainage System in Ploča (Primary School Krune Krstića in Zadar).....	5
3. Conclusion.....	7

1. Introduction

As part of A.5.8. Smart urban drainage system, two rain gardens were built in Zadar – one in Park Vruljica and the other one in Kruno Krstić Elementary School Zadar - Ploče school district. Rain gardens slow down the penetration of water, their benefits are multiple in protection against floods and climate change. As the existing drainage system shows more and more deficiencies as a result of increasingly intense stormy rain periods, we looked for new effective solutions, and the benefits of rain gardens proved to be multiple. Their drainage systems slow down the penetration of water, and surpluses are "sanitized" by well-chosen plants with an absorbent character.

2. Smart urban drainage system in Zadar

Zadar County Development Agency ZADRA NOVA implemented smart urban drainage systems as one of the solutions for reducing water runoff that is causing floods in the City of Zadar. Smart urban drainage system will recreate the natural function of the land which includes capturing rainwater filtering out pollutants and recharging groundwater. They can be designed as simple as digging a shell or depression and filling it with native plants and soil amended with sand. At the same time, they can store large amounts of rainwater that can be used in the irrigation process. Also, systems are protecting the natural water sources and create cleaner and greener areas for the citizens.

2.1. Smart Urban Drainage System in Park Vruljica

Infrastructure works in park Vruljica started on March 18th 2022 and officially finalized in February 2023. The reason why this rain garden is located right in the Vruljica park is frequent floods, which caused great damage in the park area. It has the capacity of six (6) cubic meters. In the rain garden, there are linear grids in several key locations to collect rainwater, drainage pipes are placed underneath to create a sustainable drainage system, one water separator to collect and clean excess water and several "rain modules" that work on the sponge principle.



Figure 1. Infrastructure works in park Vruljica - initial state

Along with appropriate indigenous and highly absorbent plants, communal urban equipment (benches, trash cans, lamps) was placed in the rain garden.



Figure 2. Walking path constructed with wooden benches, public lighting and trash cans

2.2. Smart Urban Drainage System in Ploča (Primary School Krune Krstića in Zadar)

Infrastructure works in Kruno Krstić Elementary School Zadar - Ploče started on March 15th 2022 and officially finalized in February 2023.

An outdoor classroom with wooden benches and tables, wooden climbing poles and garden beds were built in the area of the rain garden. The students got the opportunity to take care of their garden and learn something more.



Figure 3. The landscaped garden of the elementary school in Ploča

3. Conclusion

Smart urban drainage systems reduce the possibility of flooding due to sewage overflows. In addition, they reduce pollution and improve the quality of surface and underground waters. They also improve greenery and increase biodiversity. The built rain gardens in Zadar will affect the reduction of harmful effects on human health and the environment, but will also raise citizens' awareness of flood risks.