



# CLIMATE DETECTIVES 2021 – 2022



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## RESEARCH QUESTION

**Do (and if so, how) citizens contribute to water retention in Konstancin-Jeziorna?**

## SUMMARY OF PROJECT

The problem, in our opinion, is the waste of rainwater and the excessive use of water from the municipal water supply when watering gardens (Konstancin-Jeziorna is famous for its beautiful and extensive gardens).

Rainwater retention is an important way of saving water. It contributes to retaining and using rainwater in the place where it falls, and thus in the long run prevents desertification, especially of urban areas. In cities, the main reason for lowering the level of groundwater is decreasing of biologically active surface due to development of buildings and hardening of surfaces intended for traffic and parking cars on properties. Rainwater retention can promote the reduction of water consumption from the municipal water supply.

In order to investigate the problem, we chose a part of Konstancin-Jeziorna occupied by single-family houses and carried out a study in 5 points, where rainwater was collected and used for watering gardens. Rainwater was collected to 10-liter containers, and measurements were summed in weekly intervals. We conducted the study from 7.02 to 17.04.2022.

The research was preceded by a city-wide questionnaire survey. It was carried out in order to find out what the residents' attitudes towards small-scale retention are and what percentage of them already collect rainwater.

Moreover, we conducted a pilot study of rainwater harvesting on a balcony (area of 2.5 m<sup>2</sup>) in a multi-family block of apartments in order to find out whether such micro-form of retention can bring tangible benefits in the future.

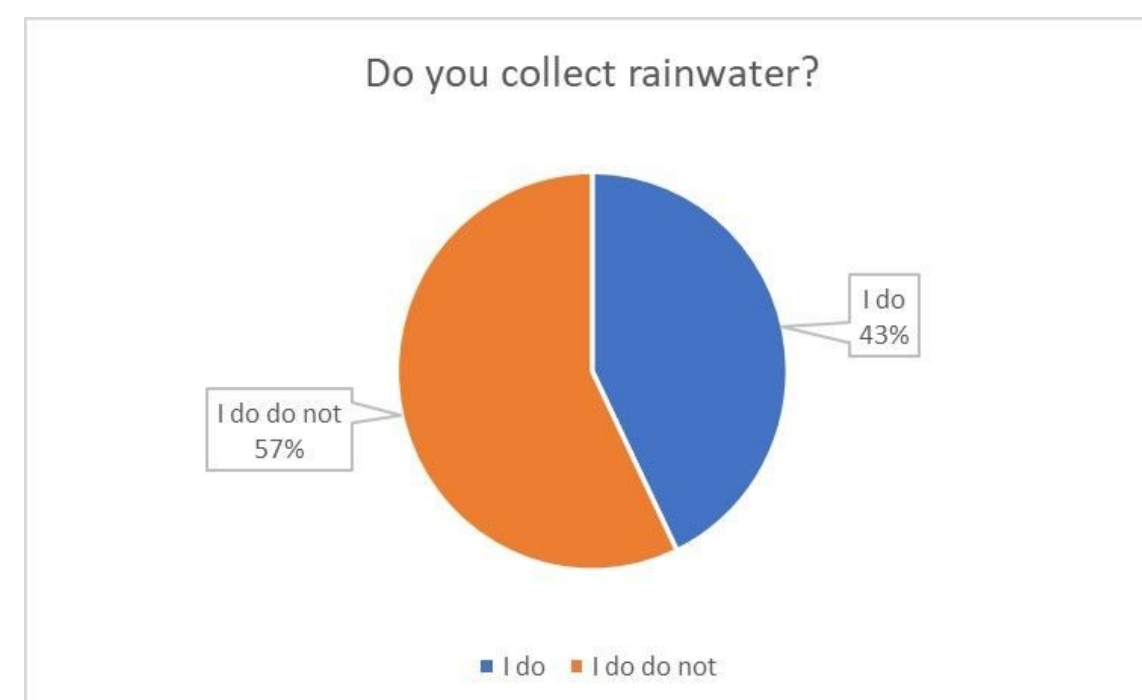


Figure 1: Collecting rainwater

## MAIN RESULTS

Prior to the study, we conducted a questionnaire interview with 71 property owners. 43 refused to provide data.

Of the 26 respondents who agreed to complete the questionnaire, 57% do not collect rainwater, 43% do.

Reasons for not collecting rainwater given by respondents:

- hassle of collecting and storing rainwater
- discouragement with effects from previous years (too little water).

Among the 26 respondents, the frequency of watering was distributed as follows:

- 25% of individuals watered the garden daily. The same percentage of respondents watered the garden 1 time per month;
- 21% watered 1 time per week;
- 14% twice a month;
- 11% incidentally;
- 4% not at all (these were people who did not collect rainwater).

The tools used by the respondents for watering the garden were garden hose (city water supply) - 39%, watering cans - 39% and irrigation systems - 22%.

Respondents collecting rainwater used it 100% for watering garden plants.

The main survey consisted of property owners collecting as much rainwater as possible, recording the results at weekly intervals, and indicating what purposes the rainwater was used for.

The surveys were conducted over a two and a half month period from 7/02 to 17/04/2022. The surveys were conducted on 5 properties.

A total of 1057 liters of rainwater was collected. The rainwater was used to water the garden with 820 liters (which is 78% of the collected water) and 237 liters to water potted houseplants (which is 22% of the collected rainwater).

A single unit pilot study with rainwater harvesting on a 2.5 m<sup>2</sup> balcony yielded the following results. From the area of 2.5 m<sup>2</sup> of the balcony, 7.5 liters of rainwater was collected from 7.02 to 17.04.2022, all of which was used for watering domestic potted plants.

1) For single-family buildings

From the roofs of the 5 buildings participating in the study, 1057 liters of rainwater were collected in just over 2 months, despite the fact that for the purposes of the amateur study, some rainwater during heavy rainfall "escaped measurement" after overflowing the control containers. This gives a water saving of over 100 liters per month per single family home!

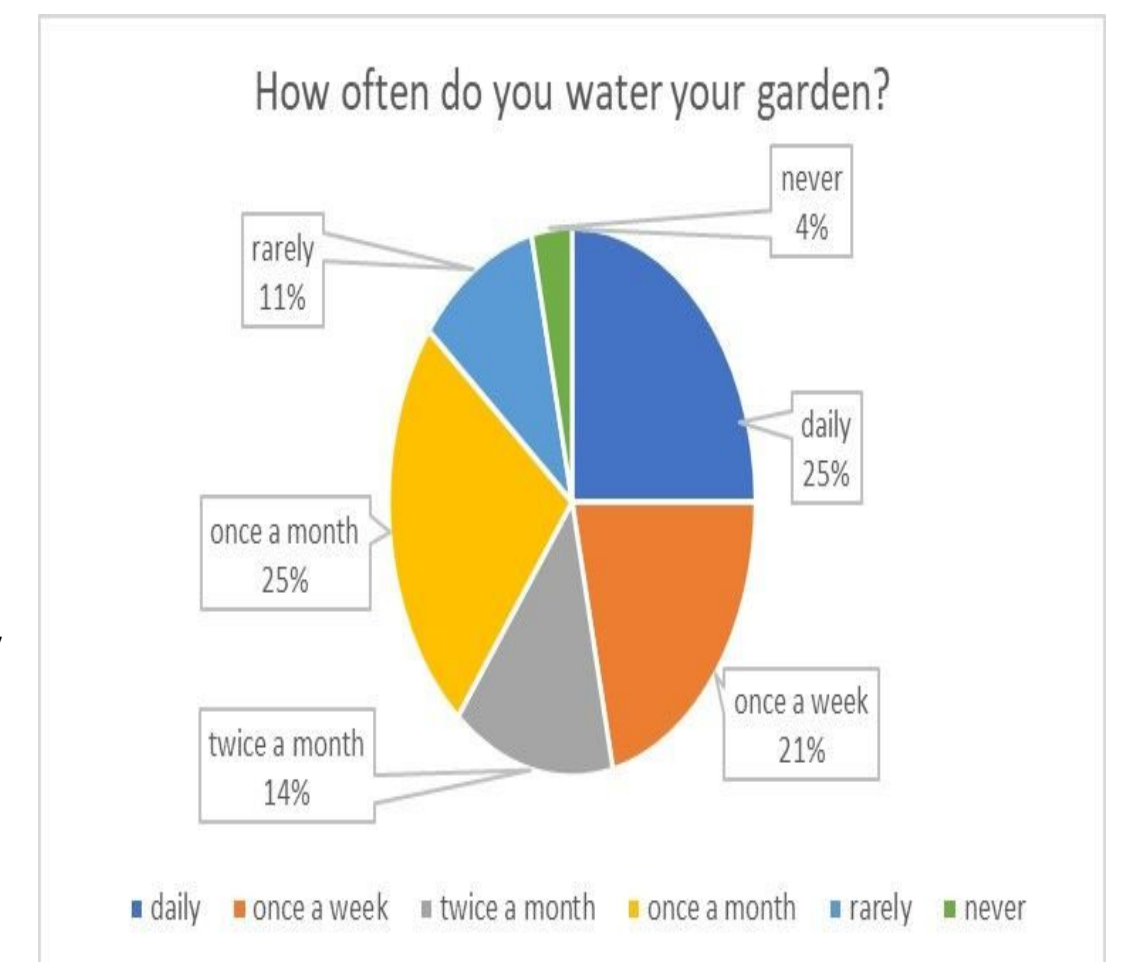


Figure 2: How often do you water your garden

## ACTIONS TO HELP LESSEN TO THE PROBLEM

To encourage the residents of Konstancin-Jeziorna to collect rainwater we are planning an action promoting small retention. For this purpose, we will share our research and conclusions with the local community in the following way:

- We will make posters showing that, with a small effort (amateurishly, without expensive systems), everyone who lives in a single-family house can acquire "for free" about 100 liters of water per month. We will put up posters in the building and on the school's website (parents of our students live mainly in single-family houses);
- We will make leaflets about our project and its results and put them in the letterboxes to encourage the residents of Konstancin-Jeziorna to rainwater retention;
- We will write an ecological article to the local press about our study and its results, encouraging residents to capture rainwater;
- We will share our project with the municipality of Konstancin-Jeziorna to contribute to a greater ecological awareness of the inhabitants - if students can retain the rainwater, so can adults.

Figure 3: