

Photo: Gerald Smith

Lessons on Sustainability

Lesson 1:

[Story of Johannes, and the 20 year dam.](#)

Available Data:

- [Historic rainfall data](#)
 - [1950-1992](#)
 - [1992 - 2022](#)
- [Population change of Karpathos in same time.](#)
- average liters per day needed = 2-4 liters per day
- Size of proposed dam is 1,300,000 cubic meters

The problem - Drinking water is an important resource for islands. Most of the drinking water for the residents of Karpathos is collected from rainwater.

When considering expensive infrastructure projects, municipal officials and engineers need to consider the usefulness of the project over time. In 2006, the municipality of Karpathos started a project to build a

1,300,000 m³ dam.

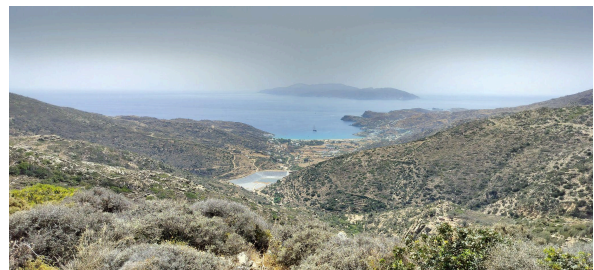


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Step 1: Explore the data.

1. The rainfall data comes in two sections, [from 1950 to 1991](#), and [1991 to 2020](#). Explore both datasets on their spreadsheets. Are there any interesting data points in the spreadsheet? Write at least 3 lines.

2. Examine the data on rainfall per month over time, and [use Tuva to make at least one visual representation of arrivals over time](#).
3. What is one question that this dataset could answer?
4. Explore the population dataset. Use Tuva to make at least one visualization. Write 2 lines about any interesting trends you see.

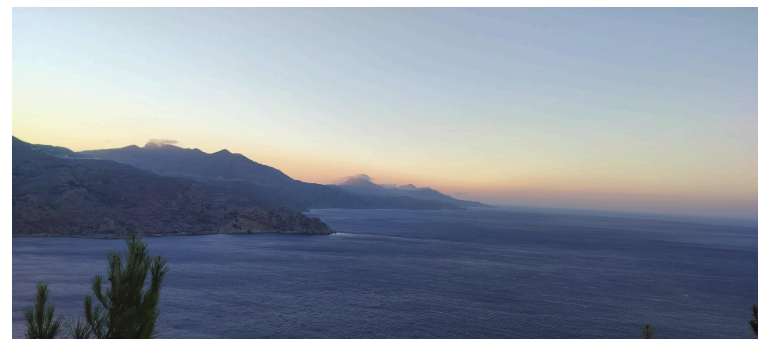
Step 2: Analyze the data

1. Use Tuva to make a graph to show rainfall over time between 1950 and 1991, and a second one between 1991 and 2020, or use this one. How is the amount of rain falling on Karpathos changing?
2. Use Tuva to make a graph to show population over time between 1950 and 2020, or use this one. How is the population on Karpathos changing?
3. Compare these last two trends. How do they relate to each other?
4. *Linear Regression* Use Tuva to perform a linear regression on the rainfall, and population, and each method of arrival to predict these amounts for the year 2030.



Step 3: The Task:

Use the rainfall data provided to estimate how much would be in the reservoir based on the given rain. We'll need to assume at least an additional 40% of water would flow into the reservoir in addition to the rain that falls directly onto it. Will the rain be enough to fill the reservoir?? Will there be enough rain to keep up with the population?



Topics: problem solving, volume, data analysis