

1.2 Bias and Ethical Issues with Climate Change Data

- 1. What potential is there for bias or ethical issues when dealing with climate change data? Where would ClimateWins need to be cautious about using machine learning to develop answers? Consider the following questions and write an answer of around 200 words showing what pitfalls ClimateWins should avoid:**

This data set does not have personal information, rather numerical data on weather. There are regional and cultural biases in climate change which could skew data; models may underestimate requirements and vulnerabilities of specific populations or overestimate regions with more data.

Models are often trained on data from the Global North, which may not be representative of diverse socioeconomic and cultural contexts globally. ClimateWins' data is focussed on mainland Europe, and strategies for this region may be inappropriate for others with different weather conditions (selection bias).

Human bias can depend on the human's perception and attitude towards climate change, which may be politically motivated and not present a fair and equal amount of data. A human may focus on say the change in temperature over other weather conditions such as windspeed or precipitation (interaction bias) meaning machine learning cannot factor these in. Humans may neglect factors they don't believe matter, or their industry may have vested interests in limiting where it may be contributing to climate change.

Machine learning could make incorrect decisions on weather conditions worsening if not trained properly and equally, due to biases in the training data and complexity of weather systems. There is danger of applying results from one region to another which are inappropriate, e.g. underestimating severe conditions leading to loss of life. We should balance machine learning with human feedback to provide contextual judgement.