ClimateScan in the UK: case study Birmingham

By Bradley Jones

Brief intro and background behind my research project

Over the summer I carried out a research project in partnership with Deltares and Hanze university of applied sciences in Groningen (HUAS). The project brief was to map and analyse green-blue climate adaptation using ClimateScan. There are a lot of different areas to investigate on this topic which meant that there was flexibility in what I could choose to be the specific focus of my research project. I collaborated with Floris Boogaard (HUAS/ Deltares) and Meghan Alexander (university of Nottingham), my project supervisor, to determine which areas should be covered by my research project. The emerging field of using Nature-Based Solutions (NBS) to address the issues such as flooding, heat stress, poor air quality, low levels of biodiversity, and poor standards of well-being amongst the population, which are prevalent in urban areas, provided the basis for the direction my research project would take. This is because, owing to the fact the use of NBS is not widespread across all urban areas, there is a limited pool of knowledge and examples for decision-makers to draw on. Consequently, this presents several barriers to the implementation of NBS such as uncertainty over the cost-effectiveness of installing such infrastructure, a lack of investment in NBS and a lack of engagement from the variety of stakeholders which required to implement NBS. Therefore, with these issues in mind, I settled on the title '*Using ClimateScan to map Nature-Based Solutions (NBS) in Birmingham City Centre (BCC) to investigate the potential applications of the site for decision-makers and policy'.* This allowed me to explore how ClimateScan can advance knowledge on the effective implementation of NBS, explore the usefulness of the data ClimateScan can provide in identifying opportunities and gaps for further implementation of NBS and discuss how the knowledge gained from ClimateScan can contribute to the delivery of policy.

Method of research project

To explore the potential applications of ClimateScan, I would need to use the site in an urban environment. As a citizen science initiative, ClimateScan aims to allow users to log examples of NBS directly onto the site whenever one is identified (Restemeyer and Boogaard, 2020). Therefore, this project adopted this approach by covering the fieldwork area on foot and logging examples of NBS whenever one was found. This was done by accessing ClimateScan on an iPhone and logging the position of each example using the map application on this device which allows an individual to know their exact location. The category of NBS which the example most aligned with was then selected to assign the corresponding colour to the point which had been added to the map. A picture was then taken using the iPhone and a description of the example was uploaded. This picture and the relevant description would then be displayed if the point which had been added was clicked on by another user, thus making use of the interactive feature of ClimateScan. Birmingham City Centre was chosen as the fieldwork area owing to there being a low number of examples of NBS logged on ClimateScan from the city. However, following my research project there are now over 120 examples logged on the site.

Following the completion of the fieldwork, spatial analysis was carried out to demonstrate how the data from ClimateScan can be used to identify patterns, gaps, and opportunities

which could be relevant to decision-makers and policy. This involved comparing the locations of the NBS which had been mapped on ClimateScan with maps which indicated the variations in vulnerability to flooding, heat stress and poor air quality which exist across BCC. Doughnut graphs were also produced to provide a visual presentation of the overall profile of BCC.

Results and Conclusions:

Overall, the findings illustrated the potential applications of using ClimateScan for decision-makers and for aiding the delivery of policy. Firstly, the profile of the categories of NBS in BCC shows that measures which primarily address heat stress, air quality and well-being are under-represented based on the severity of those issues in the area. These findings illustrate gaps in the current NBS which decision-makers can explore to ensure issues are more effectively addressed by NBS going forward (Figure 1).

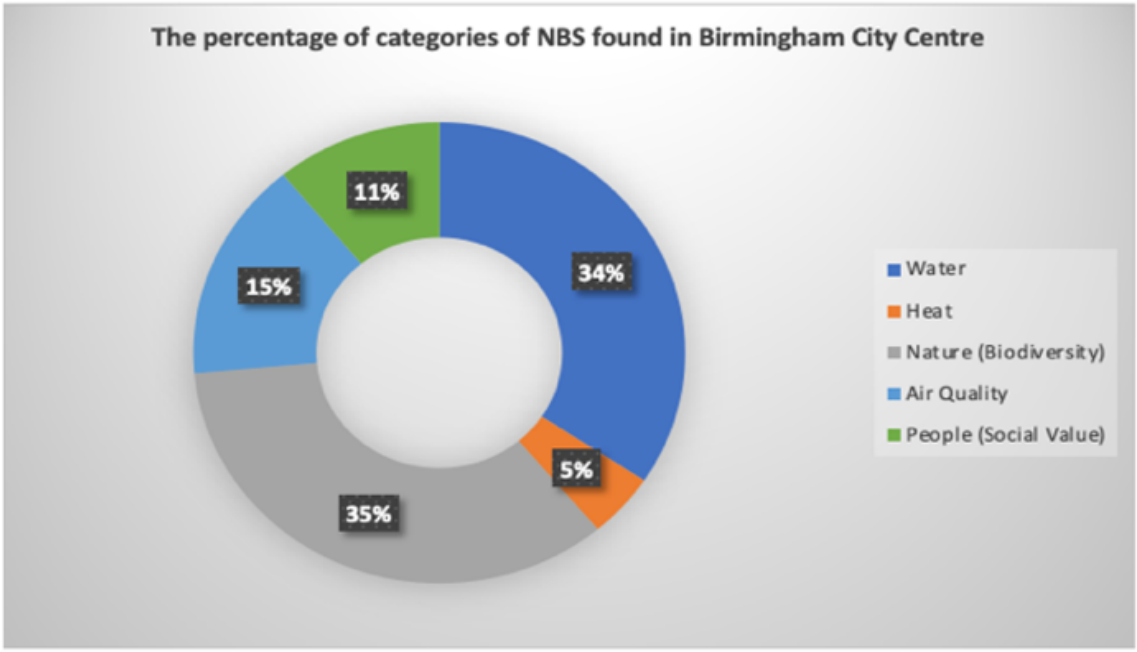

Figure 1: A doughnut graph showing the percentage of categories of NBS found in BCC.

The profile of the types of NBS in BCC illustrates a similar trend with some types implemented more than others (Figure 2). The production of this profile creates the potential for comparisons with the examples of NBS used in another city which has been mapped. This can enable lessons to be transferred to adjust the implementation of NBS to ensure the types of measures in place suitably address the issues facing the area.

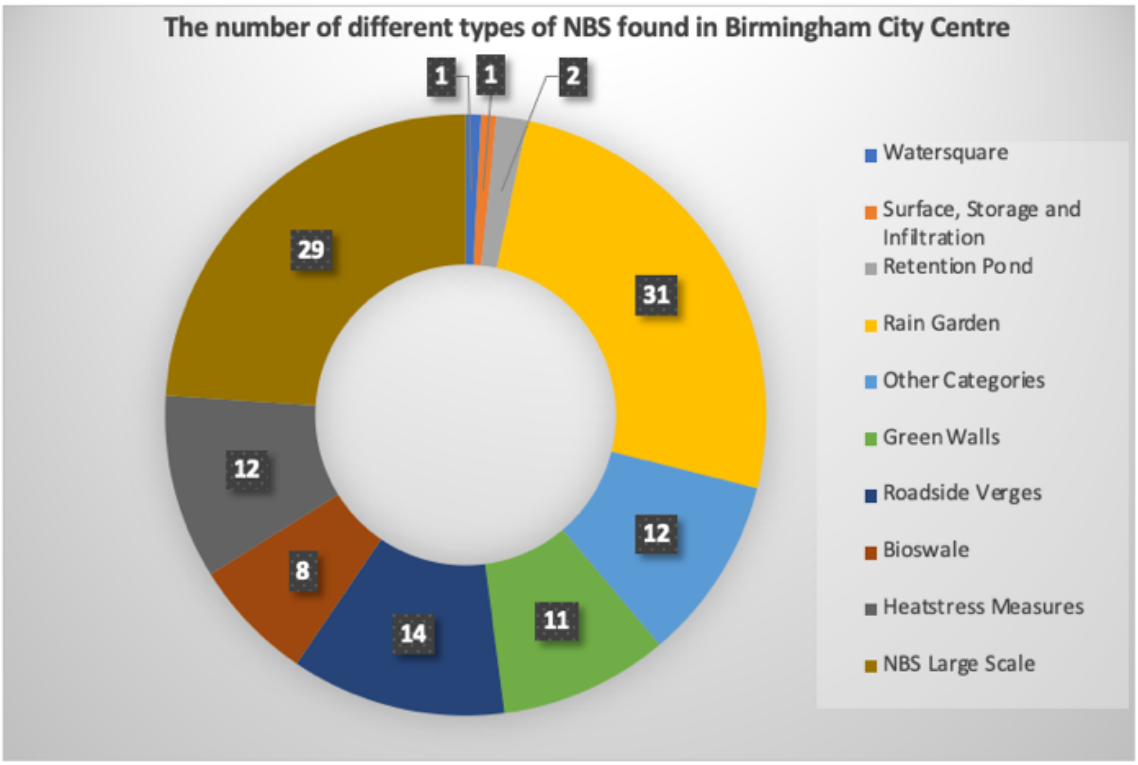

Figure 2: A doughnut graph showing the number of different types of NBS found in BCC.

Comparisons between the NBS which have been mapped and other data have also revealed several patterns. For example, the comparison between NBS and the type of land use in which they are located revealed that there are few NBS found in industrial areas in BCC. This presents an opportunity for Birmingham City Council since using examples of where NBS are implemented in other cities can reveal which types of NBS would be suitable for implementation for the characteristics of that land use. Another useful comparison made was between the area's vulnerability to different issues and where NBS have been implemented. This builds on the findings revealed by the profile of the categories of NBS in BCC by illustrating the specific areas in BCC which are vulnerable to particular issues but don't have the required NBS in place. For example, figures 3 and 4 illustrate that the NBS categorised as primarily addressing issues relating to water are not consistently found in areas which experience a high extent of flooding. This shows that using ClimateScan in combination with other datasets presents opportunities for decision-makers to explore where NBS can be implemented to improve how effectively issues are addressed.

Figure 4: A map of Birmingham City Centre showing the extent of flooding from surface water (Gov.UK, 2023).

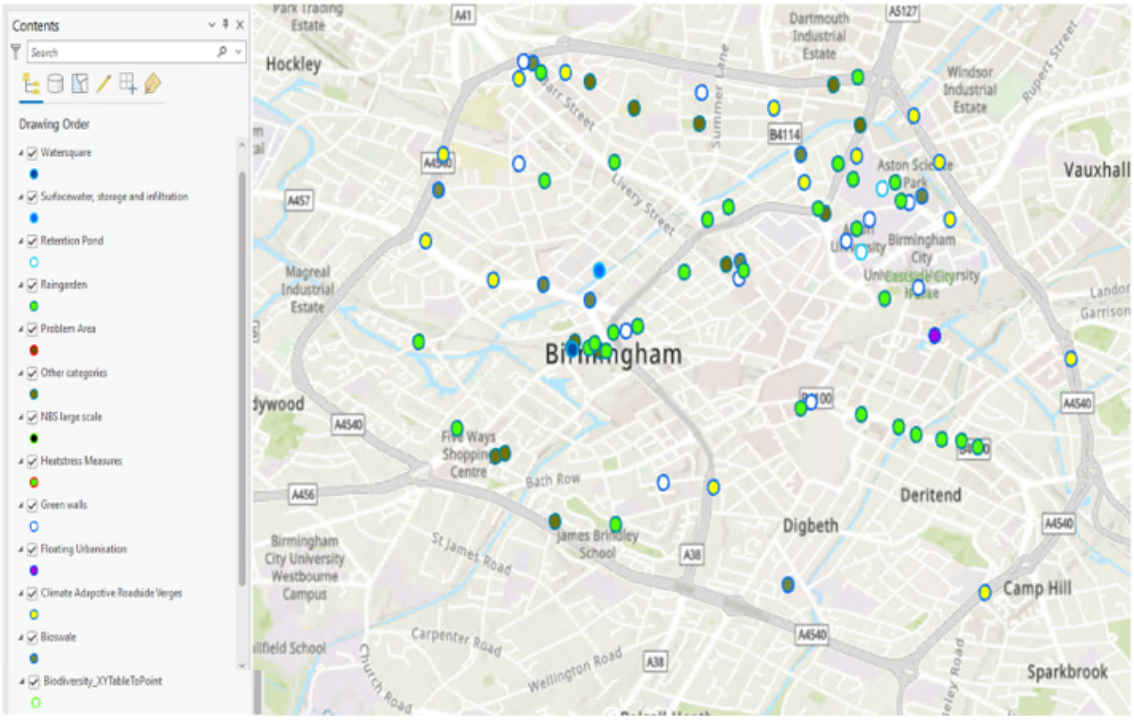

Figure 3: The NBS which have been mapped during the fieldwork which address water as their primary issue.

The accumulation of such knowledge illustrates the usefulness of mapping applications such as ClimateScan in providing data that may be used to support the delivery of policy which addresses the issues associated with climate change and urbanisation. Essentially the use of the data from ClimateScan can contribute to increased confidence in what is required to effectively implement NBS. This helps overcome some of the barriers to the implementation of NBS, such as uncertainty over cost-effectiveness and lack of funding, as there can be greater certainty that such measures will provide the desired benefits. Consequently, this can enable more widespread implementation of NBS which can help achieve the aims of policies such as the 25-year environmental plan and the local recovery strategies because the benefits NBS provide align with the issues these initiatives are looking to address. Additionally, applications, such as ClimateScan which allow anyone to contribute, can utilise local knowledge which can provide valuable insights based on a person's experiences of the area which professionally gathered data may miss. This means that the use of these initiatives has the potential to provide more detailed and accurate data which contributes to the implementation of NBS being more effective.

Final Remarks:

Overall, the findings and experiences I have gained from the research project have informed several recommendations. Firstly, decision-makers in Birmingham should engage with the data which can be gathered from ClimateScan. As shown by my report, ClimateScan can demonstrate several areas regarding the implementation of NBS in BCC which could be explored to improve how effective these measures are at addressing issues which are prevalent in the area. Therefore, engaging with mapping applications such as ClimateScan can ensure that NBS can aid in the delivery of policies and strategies which look to address these same issues. Secondly, the use of ClimateScan should also be employed by decision-makers in other cities which are looking to use NBS to address issues such as flooding, heat stress, poor air quality, low biodiversity, and poor well-being. This is because, if the same methods which have been used in this report are utilised, they can yield similar insights for the effectiveness of NBS in other cities. This can help achieve the policies and strategies of other local councils which can contribute to the delivery of national targets relating to mitigating against the effects of climate change, ensuring the recovery of nature, and maintaining good well-being which are outlined by the 25-year environmental plan and the local nature recovery strategies.

Finally, it would be preferrable for decision-makers to support education programmes focussed on the effective use of ClimateScan. This could involve collaborating with ClimateScan to tailor the methods which are used to provide people with the chance to use the site to a wider audience. ClimateCafe's are workshops which are currently used to provide young professionals and practitioners with the chance to come together for a few days to gather factual data about the vulnerabilities and (potential) solutions of a defined urban or rural area using ClimateScan (Kluck and Boogaard, 2021). Local councils could work with ClimateScan to diversify these workshops to make them accessible for the general public, thus giving them a similar opportunity to learn how to use ClimateScan. This can act

as a way to introduce more people to the site which can encourage more data to be gathered. As a result, increasing the amount of data can increase the capacity of ClimateScan to inform decision-makers of opportunities in urban areas where NBS could be implemented and enable lessons to be transferred from mapping which has taken place in other cities.

References:

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