

# Landscaping for Climate resiliency at the Bellairs Research Institute

By

Sunayana Sashikumar, Jessie Green and Chelsea Kingzett



## Meet the Team!

<b>Sunayana Sashikumar</b>	<b>Jessie Green</b>	<b>Chelsea Kingzett</b>
<ul style="list-style-type: none"><li>• From India</li><li>• Bachelors in Environment-Biodiversity and Conservation, Minor in Geography</li><li>• Email: <a href="mailto:sunayana.sashikumar@mail.mcgill.ca">sunayana.sashikumar@mail.mcgill.ca</a></li></ul>	<ul style="list-style-type: none"><li>• From United States</li><li>• Bachelors in Environment and Development and Minors in International Development and Social Entrepreneurship</li><li>• Email: <a href="mailto:jessie.green@mail.mcgill.ca">jessie.green@mail.mcgill.ca</a></li></ul>	<ul style="list-style-type: none"><li>• From Canada</li><li>• Bachelors in Environment-Ecological Determinants of Health</li><li>• Email: <a href="mailto:chelsea.kingzett@mail.mcgill.ca">chelsea.kingzett@mail.mcgill.ca</a></li></ul>

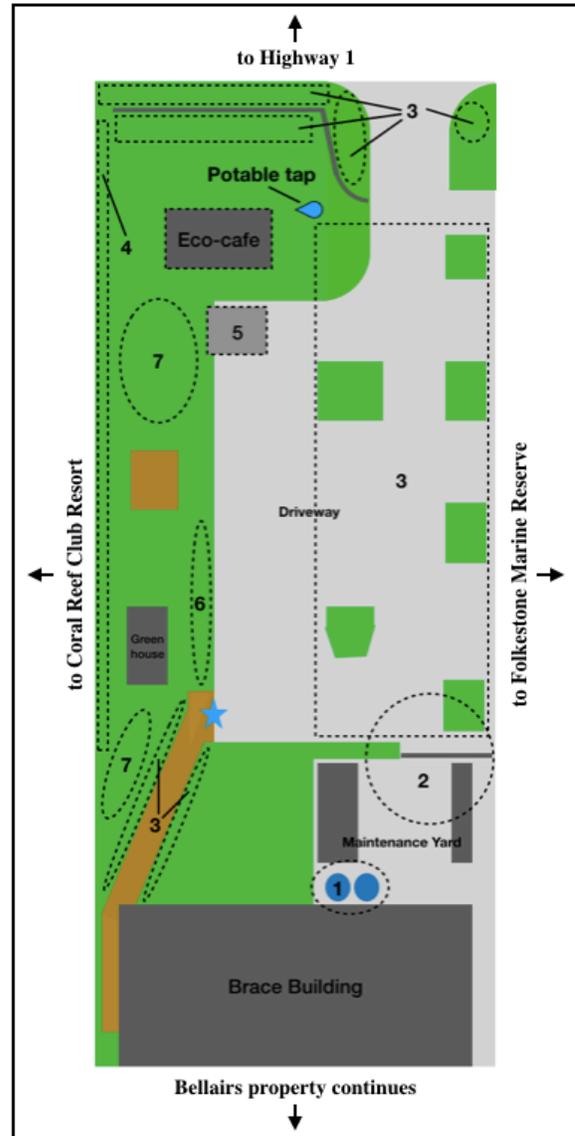
## Introduction

This project, initiated by the McGill Office of Sustainability (MOOS), will create a framework for climate resilient landscaping at the Bellairs Research Institute in Barbados (Figure 1) through comprehensive recommendations and selected interventions. This framework could provide a model upon which MOOS will base future climate resilient landscaping interventions at Bellairs research institute. On the West coast, where the institute is located, there are many high-end developments which have created more hardscapes. This in turn has caused more water runoff into the sea and less land available for agriculture. In addition, climate change has decreased water availability in Barbados and it will become worse in the near future. These facts increase the importance of making Bellairs more sustainable and climate resilient.

## Objectives

The goal of this project was to create a more climate resilient campus setting at Bellairs through sustainable, adaptable, and ecosystem-focused landscaping. This project had two main objectives: first, recommendations for interventions on the landscape as well as long-term vegetation maintenance strategies, and second, applied research and implementation of small-scale

landscaping interventions such as the addition of new plants and soils.



**Figure 1.** Map of Planned Project Activities. The map shows: 1. Rainwater catchment tanks, 2. Rainy season loading area, 3. Pre-established beds, 4. Fenceline for living fence additions, 5. Recycled garden, 6. Cactus and succulent garden, 7. Potential fruit tree sites.

## Recommendations

These were focused on sustainable water management, areas of delayed maintenance, and long-term climate resilient vegetation

strategies. These included activities such as identification of the best sustainable irrigation methods, improving the water catchment system on site, management strategies for flooding on site, planting and management of the pre-established beds and the fence line hedges and lastly plans for the use of the Eco café space.



**Figure 2 (Top to Bottom)** Pre-established beds, Fence-line, Eco café

### Applied Research

For this portion of the project, the best methods, materials, plants, and maintenance strategies were researched for three small landscaping interventions for immediate implementation. The recycled garden, cactus and succulent garden and fruit trees were planted as part of this. These areas were

planted with low maintenance, low water, and attractiveness to pollinators as the main criteria. The soil used was a special mix made for us by the SBRC. The beds were first lined with limestone for drainage, the soil mix was added on top and additional sand for the cacti and succulents was added.



**Figure 3.** The Recycled garden



**Figure 4.** The cactus bed and the fruit tree

### Conclusion and Limitations

This project involved research and addition of a recycled container garden, cactus and succulent bed, and fruit trees to the front yard of the Bellairs property as examples of climate resilient landscaping upon which future interventions can be modelled.

We recommended that to address rainwater catchments, improvements need to be made to the irrigation systems, water catchment system needs to be expanded. For

fall flooding issues, a combination of suckwells and bioswales would be ideal. Lastly the Eco café should be turned into a shade house that can be used to instruct students and as a meeting area for horticultural societies.



**Figure 5.** A recycled garden container

There are a few concerns that arose after the project, the first being that, although the research has heavily emphasized low-maintenance landscaping as a key element of sustainable gardening, there is nevertheless a risk that the garden will not be well maintained. Second, the local culture has not yet fully embraced sustainability as a way of life. Third, there is a huge amount of uncertainty surrounding climate change. Models can make predictions about future weather patterns, but there is no way to know for certain what changes will occur. The Eastern Caribbean plant website by Sean Carrington

is a great resource to find local plants that would be viable in Barbados.



**Figure 6.** *Echinopsis oxygona* and *Kalanchoe pinnata* planted in the cacti and succulent garden

### **Acknowledgements**

We would first like to thank Susanne Ryan Graham, our very knowledgeable and supportive mentor. We would like to thank Danielle Donnelly for providing us with a lot of feedback on our paper and our planting methods. We would like to thank Jeff Chandler who provided us with a lot of knowledge and resources regarding the planting and caring of cactus. We would like to thank Ali Rivers from MOOS, for motivating the start of this project. We would like to thank Mr. Roe, Mr. Small and Damian for answering our questions regarding Bellairs, providing us with equipment and help for planting the garden. Lastly, we would like to thank the students and the professors that helped us plant our garden such as Christine Ha, Chloé Allard, Don Smith and Danielle J. Donnelly.