

FORMAT		
1. Name of resource	BGCI The Role of Botanic Garden in Practicing and Promoting Environmental Sustainability	
2. Location	https://www.bgci.org/wp/wp-content/uploads/2020/04/ReviewMedRes.pdf	
3. Alternative location		
4. Author[s]	H. Miller, C. Bailey and P. Smith	
5. Publisher/producer/host	Botanic Gardens Conservation International (BGCI)	
6. Year	2020	
7. Suggested citation	Miller, H., Bailey, C. and P. Smith (2020). The Role of Botanic Garden in Practicing and Promoting Environmental Sustainability. BGCI Technical Review, available at https://www.bgci.org/wp/wp-content/uploads/2020/04/ReviewMedRes.pdf	
8. Languages in which available	English	
9. Geographic area resource relates to	Global	
10. Does the resource relate to a specific time frame?	2015-30	
11. Type	Report	Yes
	Toolkit/Framework/Roadmap	Yes
	Sign-post to other resource	
	Case studies	Yes
	Other	
12. If this is part of an initiative, what is the initiative?		
COLLECTIONS AND COLLECTIONS-BASED INSTITUTIONS		
13. Explicit links to collections	Yes	
14. Explicit links to museums/libraries/archives	Yes	
15. Types of institutions the resource covers	Museums	X
	Archives	X
	Libraries	X
	Other	X
16. Does the resource relate to specific disciplines?	Arts, humanities and social sciences: philosophy, psychology, religion, social sciences, law, politics,	X

	language, arts and recreation, architecture, literature, history, geography and ethnology, anthropology, archaeology	
	Science, natural history, technology, medicine, engineering, manufacturing	X
17. If no explicit links to collections, justification for inclusion		
HOW IT CONTRIBUTES TO SUSTAINABLE DEVELOPMENT		
18. Collections-related activities the resource relates to (mark all that apply)		
Develop collections to protect and safeguard wider cultural and natural heritage more effectively, for example by targeting collecting to threatened forms of heritage in strategic ways		
Use collections to promote learning and educational opportunities that contribute to sustainable development more effectively, for example education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development and/or skills development relating to collections	X	
Use collections to promote cultural participation/social inclusion more effectively, for example by reducing barriers to participation, to ensure no-one is ‘left behind’		
Use collections to promote sustainable tourism more effectively, for example by developing new products based on local cultural heritage, and/or considering the rights of stakeholder groups in relation to collections		
Use collections to support research that contributes to sustainable development (including all forms of personal and self-directed research at all levels that make use of stored collections) more effectively, for example by providing effective facilities, collections and information to meet researchers’ needs		
Make decisions around collections that contribute to sustainable development more effectively		
i. employment (recruiting, staff training, staff safety)		
ii. energy consumption, greenhouse gas emissions, reduction, monitoring and reporting	X	
iii. waste management and reduction of waste	X	
iv. transport (forms of transport, energy use)	X	
v. commercial activities including copyright and IP		
vi. governance and management	X	

vii. security, disaster preparedness and risk reduction		
Direct external leadership, partnerships and collaborations towards sustainable development more effectively , for example by developing impactful partnerships		X
19. Does the resource relate clearly to any international conventions (mark all that apply)?		
Culture conventions:		
1952, 71 Protection of Copyright and Neighbouring Rights		
1954 Protection of Cultural Property in the Event of Armed Conflict		
1970 Fighting Against the Illicit Trafficking of Cultural Property		
1972 Protection of the World Cultural and Natural Heritage		
2001 Protection of the Underwater Cultural Heritage		
2003 Safeguarding of the Intangible Cultural Heritage		
2005 Protection and Promotion of the Diversity of Cultural Expressions		
Rio Conventions:		
Convention on Biological Diversity (CBD), Convention to Combat Desertification (UNCCD), Framework Convention on Climate Change (UNFCCC)		X
AIMS AND CONTENT		
20. What issues does the resource aim to address?	<p>“In September 2018, BGCI’s 11th International Congress on Education in Botanic Gardens, which was held in Warsaw, focused on increasing the impact of education and public engagement in botanic gardens. Attracting more than 500 million visitors a year, botanic gardens have the opportunity to interact with and influence a large section of society. In this context, environmental sustainability emerged as an area in which botanic gardens could have a significant impact.</p> <p>There was also the sense that we are currently not doing enough about sustainability, particularly in influencing behavioural change amongst visitors and in this way achieving real impact. The delegates felt that it was appropriate that we show leadership as the world struggles to slow and reverse environmental degradation, and mitigate and adapt to the effects of climate change. This is appropriate because environmental sustainability is consistent with our values, because our visitors are high consumers and influential, and because we have technical knowledge and skills that could be applied to solving problems and providing solutions for a more sustainable planet. In addition, of course, many of BGCI’s member gardens are already changing their practices and interactions with visitors related to water saving, food, energy, carbon, recycling and so on. This Technical Review, commissioned by BGCI’s International Advisory Council, is a first step towards</p>	

	<p>sharing some of the best practice in our sector (and outside it), then mainstreaming and scaling up such approaches. As with our previous Technical Reviews, it is based on an extensive online survey and literature search. One thing that we expected, and is borne out by the results of our research, is that while many gardens are engaged in changing or modifying their business practices, fewer gardens are challenging or trying to influence their visitors. When it comes to achieving real impact, this is where the big wins are, and this is the area of our work that we need to scale up significantly.” (p.4)</p>
21. Intended audience of resource	<p>“It is important to note that this toolkit is for everyone, from the individual looking to restore their backyard or block, to the existing nonprofit looking to make lasting change in their region. Whatever your needs or obstacles may be, where you are in your restoration journey, or what your ultimate goals are, this toolkit will help you take action.” (p.4)</p>
22. Process of development	<p>“As with our previous Technical Reviews, it [the report] is based on an extensive online survey and literature search.” (p.4)</p>
23. Organisation/structure/contents	<p>Introduction... 4 Environmental schemes and standards... 5 Methods... 6 Sustainable Development Goals... 7 Water management... 8 Introduction In-house practices Case studies Encouraging sustainable behaviour in visitors Case studies Energy consumption... 12 Introduction In-house practices Case studies Encouraging sustainable behaviour in visitors Case studies Carbon offsetting... 18 Introduction In-house practices Case studies Encouraging sustainable behaviour in visitors Case studies Waste, recycling and composting... 22 Introduction In-house practices</p>

	Case studies Encouraging sustainable behaviour in visitors Case studies Sustainable food... 26 Introduction In-house practices Case studies Encouraging sustainable behaviour in visitors Case studies
FRAMEWORKS	
24. Framework structure	
25. Relevant policy considerations	Yes
26. Resources for implementation identified	Yes
27. Specific assessment points/indicators/milestones/action plan for monitoring	Yes
28. ASPECTS OF SUSTAINABILITY COVERED BY RESOURCE (mark all that apply)	
People (social sustainability)	
Planet (environmental sustainability)	X
Prosperity (economic sustainability)	
Peace	
Partnerships	
29. CROSS-CUTTING CONSIDERATIONS COVERED BY RESOURCE (mark all that apply)	
Gender perspectives	
North and South perspectives	
HOW THE RESOURCE CONTRIBUTES TO AGENDA 2030 AND THE SDGs	
HOW AGENDA 2030 AND THE SDGs FEATURE IN THE RESOURCE	
30. SDGs and Agenda 2030 specifically mentioned?	Yes
31. SDGs specifically mentioned?	Yes
32. SDG targets specifically mentioned?	No
33. SDG indicators specifically mentioned?	No

SDGs AND SDG TARGETS AND LINKAGES	
34. Comments on SDG linkages	<p>The resource is closely linked to SDG targets including 12.6 (adopt sustainable practices and reporting); the public education aspect contributes to SDGs 4.7 (Education for Sustainable Development), 12.8 (information for sustainable development and lifestyles in harmony with nature) and 13.3. (public and staff awareness and capacity for climate action).</p> <p>In addition, it can help achieve SDGs 6.3 (reducing water pollution) and 6.4 (efficient use of water), and 7.2 (adopt renewable energy sources), 7.3 (increase energy efficiency); 9.4 (retrofit infrastructure to be sustainable); 11.4 (protect and safeguard cultural and natural heritage); 12.2 (sustainable use of natural resources); 12.3 (reduce food waste); 12.4 (reduce pollution); 12.5 (promote reuse and recycling). These actions can support SDGs 14 and 15.</p>
35. SDGs and SDG targets the resource helps advance	
<p>SDG 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p> <p>4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development</p>	<p>Numbers of people in each type of programme drawing on collections from different demographic groups.</p> <p>Increases in numbers of people in each type of programme from different demographic groups.</p> <p>Proportion of people involved in such programmes in relation to overall audience size.</p> <p>Evidence that learners have acquired knowledge and skills to promote sustainable development.</p>
<p>SDG 6. Ensure availability and sustainable management of water and sanitation for all</p>	<p>Amount of pollutants, and reduction in pollutants, to water systems.</p>

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially	Plans in place for the identification, reduction, replacement and recycling of hazardous chemical and materials, to prevent their release into water systems, with plans to eliminate their use as soon as possible.
SDG 6. Ensure availability and sustainable management of water and sanitation for all 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	Reductions in water use, increase in water recycling, preventing water shortages in vicinity. Information on, programmes relating to, and partnerships relating to water use drawing on collections and collections-based institutions in place, to support efficient use of water.
SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	Proportion of energy that comes from renewable sources. Date to achieve net zero, and milestones towards that date.
SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all 7.3 By 2030, double the global rate of improvement in energy efficiency	Reduction in energy use. Upgrade of old equipment to more efficient equipment. Uptake of renewable sources of energy.
SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 9.4 By 2030, upgrade infrastructure and retrofit	Number and proportion of collections facilities that: 1. make efficient use of resources, with an ongoing drive for efficiencies and reductions in energy use and waste of all forms.

industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	<p>2. use clean and environmentally sound technologies, including climate-friendly energy sources and materials, with an ongoing commitment to reduce greenhouse gas emissions and waste of all forms.</p> <p>3. adopt and/or prioritise collections-related processes and practices to reduce greenhouse gas emissions and waste of all forms.</p>
<p>SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable</p> <p>11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage</p>	<p><i>11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage</i></p> <p>Plans, policies and procedures in place for the safe use of collections for a variety of purposes, protecting and safeguarding both collections and those who use them.</p> <p>Plans, policies and procedures in place for the identification, safeguarding and protection of cultural and natural heritage at risk.</p> <p>Collecting programmes in place to protect, safeguard and make use of cultural and natural heritage, addressing the needs of communities and stakeholders, and ensuring that collections can be an effective resource for sustainable development.</p> <p>Number and diversity of educational, awareness-raising, research programmes, and partnerships that aim to strengthen protection of cultural and natural heritage.</p>
<p>SDG 12 Ensure sustainable consumption and production patterns</p> <p>12.2 By 2030, achieve the sustainable management and efficient use of natural resources</p>	<p>Reduction of material footprint in terms of reductions in consumption of biomass, fossil fuels, metal ores and non-metal ores.</p>
<p>SDG 12 Ensure sustainable consumption and production patterns</p> <p>12.3 By 2030, halve per capita global food waste at the retail and consumer</p>	<p>Quantities, and reduction in quantities, of food waste, both in terms of waste going for treatment, and waste going to landfill or being otherwise discarded into the environment.</p>

levels and reduce food losses along production and supply chains, including post-harvest losses	Policies and plans in place to reduce and eliminate food waste as soon as possible.
SDG 12 Ensure sustainable consumption and production patterns 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	<p>Quantities, and reduction in quantities, of chemicals of all kinds, including chemicals used in maintenance of collections facilities, and chemicals used in care and preparation of collections, and all wastes throughout their life cycle, reducing release to air, water and soil.</p> <p>Plans in place to eliminate the use and release of hazardous chemicals and harmful wastes of all kinds into the natural environment as soon as possible.</p>
SDG 12 Ensure sustainable consumption and production patterns 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Quantity and reductions in quantity of waste of all kinds, including avoidance/prevention of waste production, reuse, and recycling. Quantity of material recycled in comparison with quantity sent to landfill. Increases in recycling rate in comparison with landfill.
SDG 12 Ensure sustainable consumption and production patterns 12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	<p>Clear visions, strategies and plans in place for all aspects of sustainability – environmental, social and economic (people, planet, prosperity)- across all areas of activity.</p> <p>Visions, strategies and plans relating to sustainability to be publicly available and incorporated into planning documents.</p> <p>Commitments to be in line with local, regional, national and/or international targets and ambitions.</p> <p>Incorporation of sustainability into reporting for funders and other stakeholders, including the public. Reporting to include commitments and progress towards targets.</p>
SDG 12 Ensure sustainable consumption and production patterns	

<p>12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature</p>	<p>12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment</p> <p>Extent to which global citizenship education and education for sustainable development (including climate change education) are mainstreamed in formal, informal and non-formal education programmes and activities drawing on and related to collections.</p>				
<p>SDG 13. Take urgent action to combat climate change and its impacts</p> <p>13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</p>	<p>Plans in place to enhance positive contributions to addressing climate change through use of collections. Plans in place to ensure collections, collections institutions and broader society can adapt effectively to climate change.</p> <p>Plans in place for effective education and awareness raising on climate change mitigation, adaptation, impact reduction and early warning.</p> <p>Plans in place to reduce negative contributions of collections-related functions, e.g. measuring greenhouse emissions with plans and targets in place to reduce them.</p>				
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7	8	9	10	11	12
13	14	15	16	17	