Tree Conservation Needs Assessment

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Executive Summary

This report is an analysis of the results of a Tree Conservation Needs Assessment, conducted by [ArbNet](), in collaboration with the [U.S. Forest Service (USFS)](), in 2019. The assessment consisted of a series of survey questions focused around tree conservation. The survey was distributed to a wide range of tree-focused professionals across multiple sectors around the world. The objective of the survey was to obtain a better understanding of what the global community of arboreta and tree experts is currently doing to advance tree conservation efforts and to identify critical gaps and needs. ArbNet will use the results of this analysis to guide the development of resources, programs, and funding opportunities that address the needs of our community to most effectively support global tree conservation efforts.

Survey responses were categorized by sector based on the type of institution the respondent worked in. Responses were also designated as a biodiversity hotspot if the respondent institution was in or near (within ~ 200 miles) a biodiversity hotspot as defined by [Conservation International](). Responses were also categorized by the country's level of economic development based on the definitions outlined by the [World Bank 2020]() and designated either High-Income Economy (HIE) or Non-HIE, which included low-income, lower-middle income, and upper-middle income economies.

Major findings:
- A total of 591 respondents from 46 countries completed the needs assessment (77% were from the U.S.).
- 56% of responses were from biodiversity hotspots, 44% non-biodiversity hotspots; 92% of responses from HIE countries, 8% Non-HIE countries.
- Nearly all respondents (>97%) are currently participating in tree conservation activities of some sort.
- The top three most commonly reported activities that respondents are already doing are 1) providing public awareness or education, 2) managing or restoring habitat, and 3) protecting land or habitat.
- The activities that respondents would like to do more of are 1) conduct climate change research or niche modeling, 2) perform population reinforcement, reintroductions or translocations, and 3) conduct tree species threat assessments.
- The major obstacles to engaging in tree conservation activities are a lack of funding, staff and time. Respondents from Non-HIE countries reported that a lack of collaboration opportunities was a major obstacle.
- The most helpful resources to support conservation activities are 1) collaborative partnerships, 2) funding, and 3) guidelines/case-studies.
- The botanic garden sector (including arboreta) is the most commonly reported type of collaborator on tree conservation activities.
- Local communities and protected land managers (public lands) are the stakeholder groups that respondents most frequently engage in tree conservation activities.

This report provides a synthesis of the needs assessment results. For each question, we compiled relevant resources and helpful links that provide further information on that topic to address the identified needs. The results of this assessment will be used to create original resources that support the needs of our community to build conservation capacity at arboreta and other tree-focused institutions around the world.

We encourage those who did not participate in this assessment, to contribute their thoughts and provide additional insights on the questions below by emailing Amy Byrne, Global Tree Conservation Assistant ([abyrne@mortonarb.org]()).

Demographics of Respondents

Figure 1. The geographic distribution of survey responses representing 46 countries (highlighted in gray).
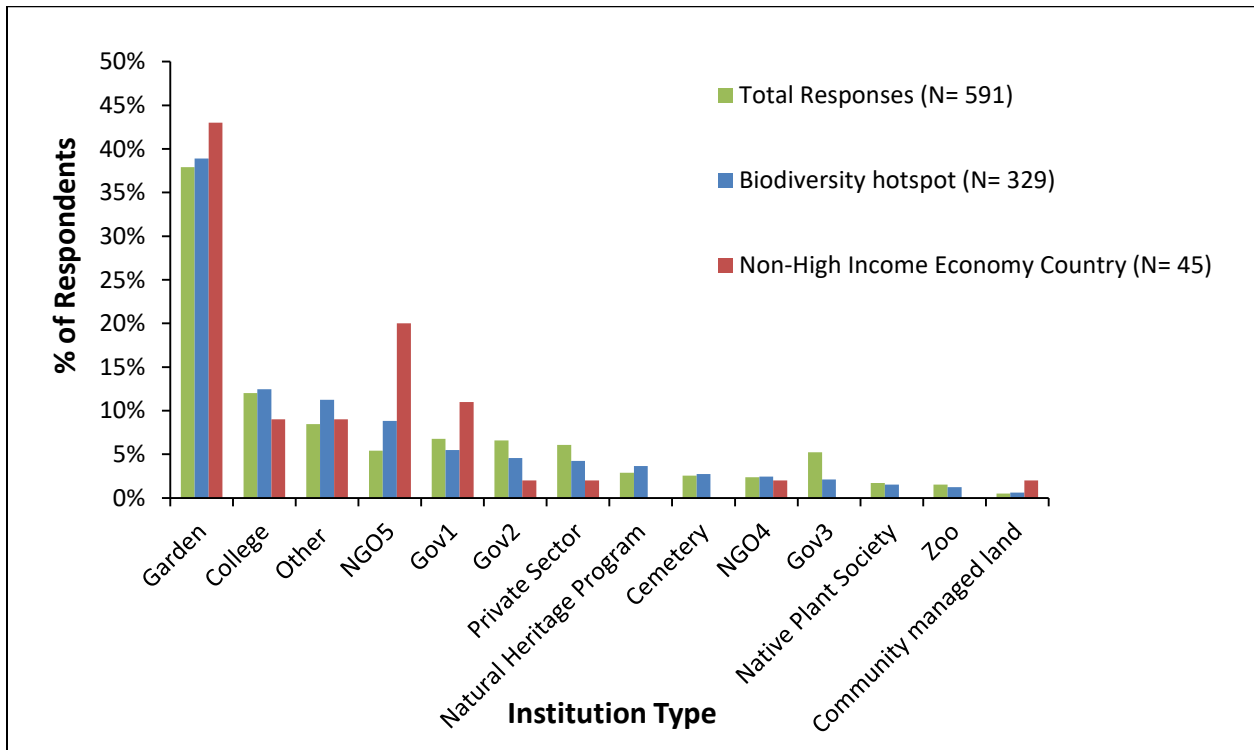
[1]Government (local), [2]Government (national, other than USFS), [3]Government (USFS), [4]NGO (international), [5]NGO (local)

Figure 2. Demographics of Survey Respondents. Each respondent was categorized by sector (x-axis) based on the type of institution in which they work (green bars reflect the % of total responses in each sector). Responses that represent a biodiversity hotspot are represented by blue bars; Non-High Income Economy (Non-HIE) countries are represented by red bars.

Survey Questions

1) Is tree conservation a primary goal or objective of your institution?

2) Is tree conservation a primary goal or objective of your role?

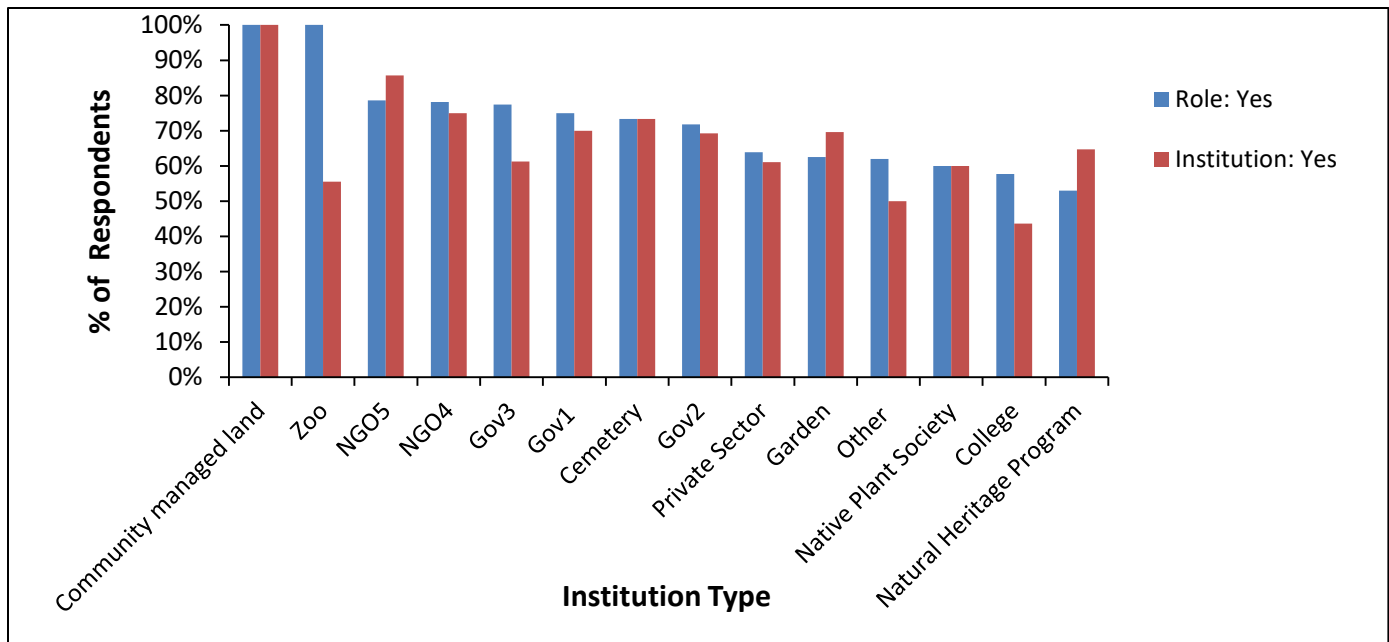[1]Government (local), [2]Government (national, other than USFS), [3]Government (USFS), [4]NGO (international), [5]NGO (local)

Figure 3. Proportion of respondents, by institution sector, reporting conservation is a primary goal of their institution and role
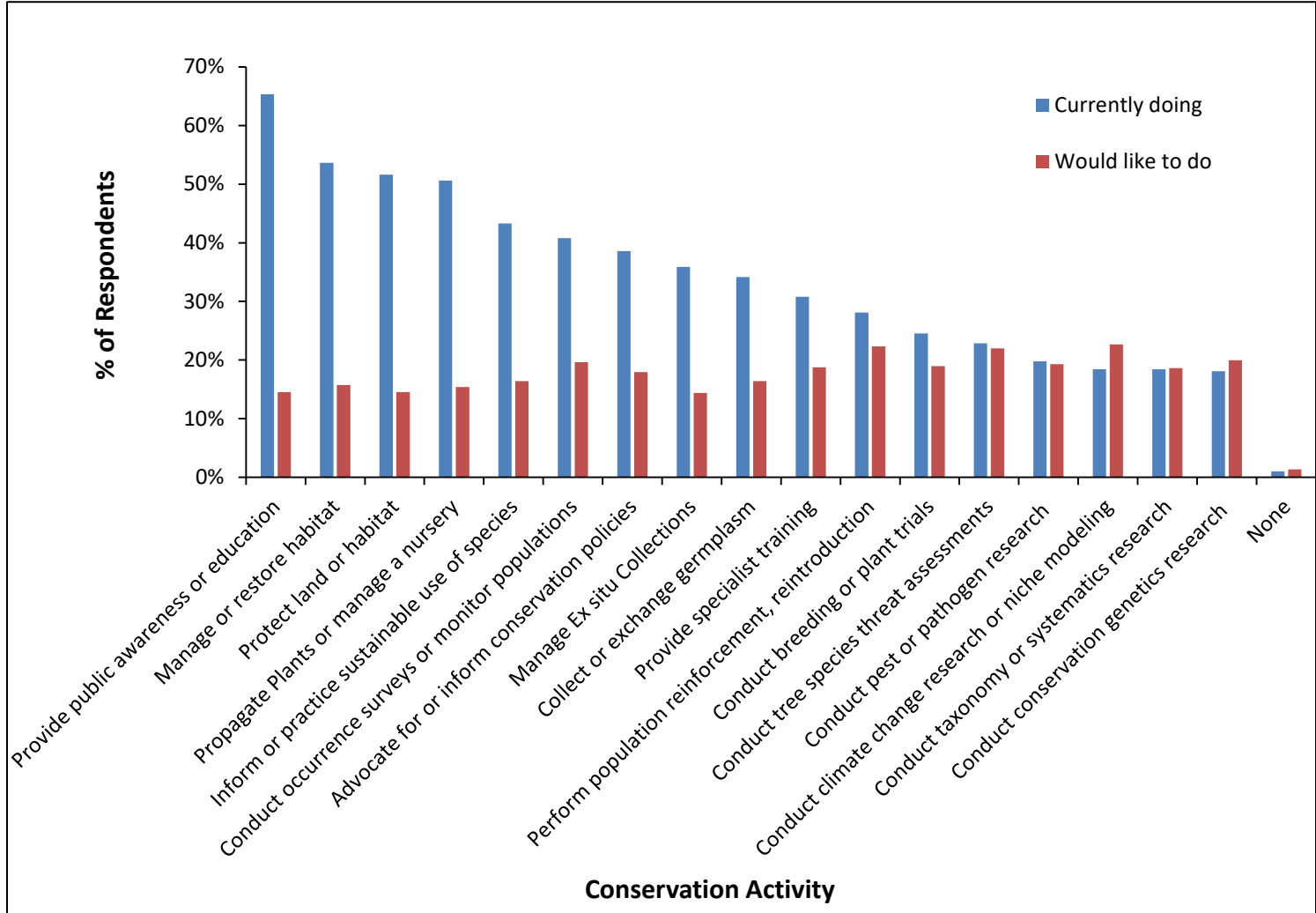
Results:
- Non-HIE countries had a higher proportion of respondents reporting that their institution and role have a conservation focus, compared to respondents from HIE countries.
- A higher proportion of respondents from outside biodiversity hotspots reported conservation is a primary focus of their role than respondents within biodiversity hotspots. Conversely, a higher proportion of respondents within biodiversity hotspots reported conservation is a primary goal of their institution compared to responses from outside biodiversity hotspots.

> **Q1 and Q2 Synopsis:** Overall, respondents from Non-HIE countries were most likely to be from an institution that prioritizes conservation, and to have conservation be a primary goal of their job.

Q1 and Q2 Resources:
- APGA's biodiversity and conservation benchmarking assessments and tools
- GlobalTreeSearch and ThreatSearch. Databases to identify tree species of conservation concern in your region
- BGCI and Montgomery Botanical Center Building living plant collections to support conservation: Guide for public gardens
- BGCI's Paul Smith, Integrated Plant Conservation talk: What the garden community can do to stop plant species extinctions
- Center for Plant Conservation: Best Plant Conservation Practices to Support Species Survival in the Wild
- CPC Rare Plant Academy: Online, collaborative platform for the plant conservation community to learn, share and educate
- Global Trees Campaign--Guidance for non-specialists: Guides to develop basic skills required for tree conservation
- i-Tree: Online, interactive tool to quantify the benefits of trees to your environment, aids forest management and advocacy

3) Select the conservation activities your institution currently does, or would like to do more of, which benefit native and/or threatened trees:

Figure 4. The conservation activities survey respondents are "currently doing" or "would like to do more of".

Results:

- NGOs, government agencies, and arboreta and botanic gardens were the institution sectors most frequently reporting that they participate in conservation activities.
- The most frequently reported conservation activity currently underway is providing public awareness/education. Climate change research/niche modeling is the activity most respondents want to do more of.

Q3 Synopsis: The majority of respondents is currently doing something or would like to do more of the listed conservation activities; only 2.5% of respondents said they are not doing anything.

Q3 Resources: The top five reported "Would like to do" activities are: Conduct climate change research or niche modeling, perform population reinforcement, reintroduction or translocation, conduct tree species threat assessments, conduct conservation genetics research, and conduct occurrence surveys or monitor populations.

Climate Change Research or Niche Modeling
- Nature Map Earth: integrated maps with biodiversity and greenhouse gas emissions data to assist countries with designing and implementing national policies for decreasing the loss of biodiversity, as well as, decreasing greenhouse gas emissions
- NatureServe: Climate Change Vulnerability Index (specific to the U.S. region), identifies plant species vulnerable to climate change effects
- Technical Guide for the Planning of Restoration: technical guide for restoration, taking into account climate change

Population Reinforcement, Reintroduction, or Translocation
- International Union for Conservation of Nature (IUCN), Restoration Opportunities Assessment Methodology (ROAM): provides a framework for countries to readily identify areas that are ideal for forest restoration and areas of priority
- IUCN Guidelines for Reintroductions and other Conservation Translocations
- Reforestation, Nurseries, & Genetic Resources, Propagation Protocol Database: information on propagation techniques and protocols used for native plants of North America (Canada, Mexico, US)
- World Resources Institute, The Restoration Diagnostic: several documents and case studies outlining successful restoration stories taking place in numerous countries

Tree Species Threat Assessments
- BGCI: Red List learning modules
- Global Trees Campaign: how to Red List a species
- IUCN Red List: resources and tools guiding you through the Red List, outlining the necessary criteria to conduct Red List assessments

Conservation Genetics Research
- Biodiversity International Training Guide on Forest Genetic Resources: set of training materials for non-specialists focusing on tree genetic topics, great resource for learning and educational purposes
- BGCI Seed Conservation and Training Resources: resources on seed banking
- CPC Rare Plant Academy: genetic guidelines for plant conservation

Occurrence Surveys or Monitor Populations
- CPC Rare Plant Academy: example Monitoring Form
- Global Trees Campaign--*Ex situ* surveys: informative *ex situ* surveys showing how well represented certain species are in conservation collections
- Oxford University Herbarium: Manual for Rapid Botanic Survey (RBS)

4) What factors are preventing you from participating in the tree conservation activities you would like to do?
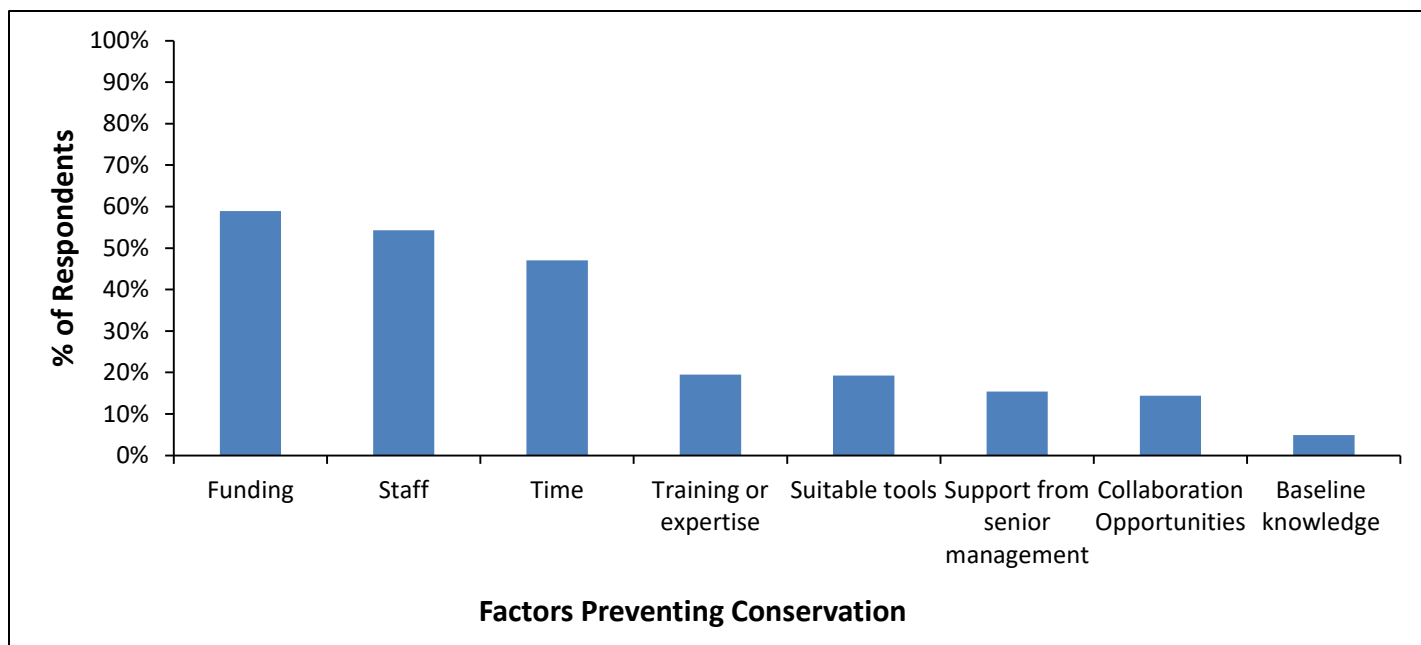

Figure 5. Factors that are preventing respondent's participation in tree conservation activities.

Results:
- 11 of 14 sectors ranked funding, staff, and time as the top three factors preventing tree conservation efforts.
- Respondents from Non-HIE countries found that funding, staff, and collaboration opportunities are the factors preventing them from participating in conservation.

> **Q4 Synopsis:** Lack of funding, staff, time, and collaboration opportunities are preventing conservation efforts

Q4 Resources:

Funding
- Grants & Funding Opportunities: ArbNet's curated list of grant and funding opportunities for tree planting/conservation

Staff
- Recruiting and Managing Volunteers Discussion Forum: Post your questions, ideas, and success stories in managing and maintaining volunteer support at your institution to ArbNet's discussion forum
- CPC Rare Plant Academy: reintroducing plants with the help of volunteers

Time
- Capacity for Conservation: assessment to help you prioritize areas for conservation development within your organization

Collaboration Opportunities
- BGCI/ArbNet Partnership Programme: Annual funding opportunity provided by ArbNet, in collaboration with BGCI, to support international partnerships to undertake tree conservation initiatives
- Conferences/Workshops: ArbNet's News and Events page outlines upcoming conferences and workshops that provide numerous opportunities/benefits such as: collaboration, education about trees or tree-related topics, networking, etc.

5) How helpful would the following resources be in supporting conservation activities?
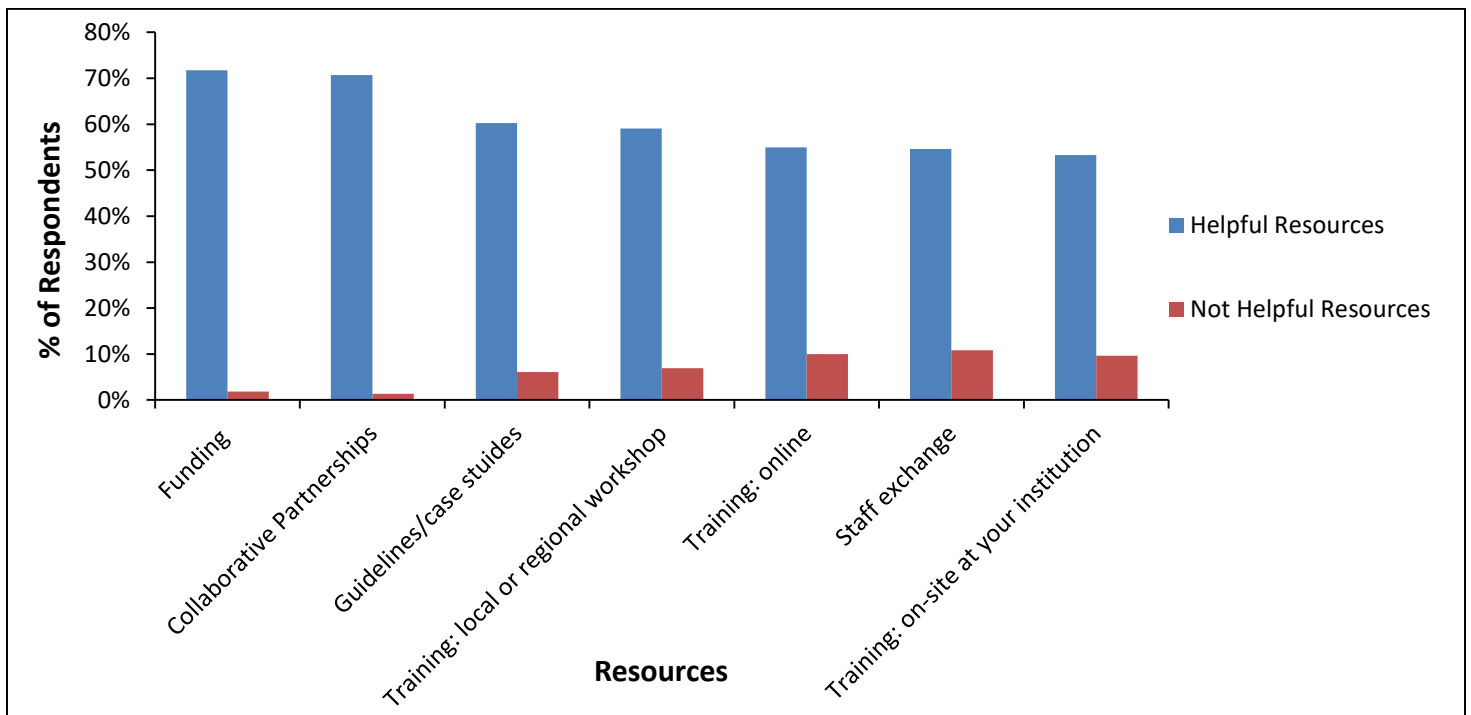
Figure 6. Percentage of respondents ranking certain types of resources as being "helpful" or "not helpful".

Results:
- Between 60-72% of respondents ranked funding, collaborative partnerships, and guidelines/case studies as helpful resources.

Q5 Synopsis: The most helpful resources are funding, collaborative partnerships and guidelines/case-studies.

Q5 Resources: The most helpful resources in supporting conservation are funding, collaborative partnerships, and guidelines/case-studies.

Funding
- Grants & Funding Opportunities: ArbNet's curated list of grant and funding opportunities for tree planting/conservation

Collaborative Partnerships
- BGCI/ArbNet Partnership Programme: Annual funding opportunity provided by ArbNet, in collaboration with BGCI, to support international partnerships to undertake tree conservation initiatives. Post project ideas on the Discussion forum.
- BGCI Seed Conservation Directory of Expertise: resource to get in connection with seed banking experts
- Conferences/Workshops: ArbNet's News and Events page outlines upcoming conferences and workshops that provide numerous opportunities/benefits such as: collaboration, education about trees or tree-related topics, networking, etc.
- Global Conservation Consortium for Oak: a coordinated network of arboreta/botanic gardens and experts who work collaboratively to implement a conservation strategy to prevent the extinction of the world's oak populations. Sign up and join today to contribute to our work and mission in conserving oaks
- International Oak Society (IOS)--Seed Exchange Forum: IOS members can post in the forum to inquire about acorn exchange

Guidelines/Case Studies/How to's
- [Biodiversity International--Training Guide on Forest Genetic Resources:](#) set of training materials for non-specialists focusing on tree genetic topics--great resources for learning and educational purposes
- [Global Trees Campaign--Guidance for non-specialists:](#) Guides to develop basic skills required for tree conservation
- [Global Trees Campaign reference manuals:](#) species recovery guides/plans
- [The Global Partnership on Forest and Landscape Restoration:](#) case studies outlining restoration success stories
- [World Resources Institute, The Restoration Diagnostic:](#) several documents and case studies outlining successful restoration stories taking place in numerous countries

6) What type of institutions are you collaborating with on conservation efforts?

Table 1. Proportion of respondents reporting collaborations with various sectors on tree conservation activities. Respondents are categorized by sector (x-axis). The types of institutions they collaborate with are shown on the y-axis. Respondents could select multiple collaborating sectors.

Respondent Sector

	Garden (N=224)	College (N=71)	Other (N=50)	Gov[1] (N=40)	Gov[2] (N=39)	Private Sector (N=36)	NGO[3] (N=32)	Gov[4] (N=31)	Natural Heritage Program (N=17)	Cemetery (N=15)	NGO[5] (N=14)	Native Plant Society (N=10)	Zoo (N=9)	Community managed land (N=3)
Garden	68%	41%	34%	50%	26%	31%	34%	26%	53%	20%	14%	50%	44%	67%
College	41%	45%	44%	33%	54%	31%	44%	68%	53%	27%	50%	70%	22%	67%
Gov[1]	39%	30%	42%	60%	36%	28%	50%	39%	35%	27%	50%	60%	11%	67%
Native Plant Society	21%	15%	22%	18%	15%	25%	13%	13%	47%	7%	14%	40%	0%	67%
NGO[3]	19%	13%	28%	20%	23%	6%	50%	32%	53%	20%	57%	30%	11%	0%
Gov[2]	19%	24%	12%	15%	49%	17%	38%	42%	47%	0%	57%	20%	0%	33%
Gov[4]	14%	23%	12%	18%	44%	19%	16%	39%	29%	7%	50%	30%	11%	67%
Private Sector	12%	8%	32%	30%	10%	47%	31%	13%	29%	20%	21%	0%	0%	67%
NGO[5]	10%	8%	8%	3%	10%	0%	13%	6%	24%	7%	14%	0%	0%	33%
Natural Heritage Program	10%	11%	14%	13%	18%	6%	16%	23%	41%	0%	36%	50%	22%	33%
Zoo	5%	1%	4%	5%	0%	6%	0%	0%	0%	7%	0%	10%	22%	0%
None	2%	3%	4%	5%	0%	6%	0%	0%	6%	7%	0%	0%	0%	0%

[1] Government (local), [2] Government (national, other than U.S. Forest Service), [3] NGO (local), [4] Government (U.S. Forest Service), [5] NGO (international)

Results:
- Regardless of respondent sector, biodiversity region, or level of economic development, the garden community (including arboreta) is the most commonly reported collaborator on tree conservation activities.

> **Q6 Synopsis:** Respondents most frequently collaborate with arboreta or botanical gardens, colleges, and local governments on conservation activities.

Table 2. Proportion of respondents reporting engaging various stakeholder groups on tree conservation activities.
Respondents are categorized by sector (x-axis). The different stakeholder groups they work with are shown on the y-axis.
Respondents could select multiple stakeholder groups.

Respondent Sector

	Garden (N=224)	College (N=71)	Other (N=50)	Gov[1] (N=40)	Gov[2] (N=39)	Private Sector (N=36)	NGO[3] (N=32)	Gov[4] (N=31)	Natural Heritage Program (N=17)	Cemetery (N=15)	NGO[5] (N=14)	Native Plant Society (N=10)	Zoo (N=9)	Community managed land (N=3)
Local Community	38%	35%	48%	70%	28%	44%	66%	13%	6%	20%	43%	70%	11%	100%
Protected Land Managers[6]	38%	25%	38%	28%	51%	14%	56%	65%	94%	7%	64%	60%	22%	67%
Private Landowners	24%	21%	30%	23%	31%	53%	44%	16%	53%	0%	71%	70%	0%	67%
Protected Land Managers[7]	19%	11%	14%	8%	10%	8%	22%	26%	82%	13%	29%	20%	11%	33%
None	11%	6%	6%	8%	5%	6%	0%	0%	0%	13%	0%	0%	11%	0%
Industry	10%	11%	16%	23%	26%	36%	9%	23%	18%	20%	7%	0%	0%	0%
Indigenous Peoples	8%	11%	8%	10%	18%	8%	16%	13%	6%	7%	7%	10%	0%	33%

[1] Government (local), [2]Government (national, other than U.S. Forest Service), [3]NGO (local), [4]Government (U.S. Forest Service), [5]NGO (international), [6]Protected land managers (public lands), [7]Protected land managers (NGOs)

Results:

- 40% of respondents from Non-HIE countries reported that they work with indigenous peoples in conservation activities. Comparatively, only 7% of respondents from HIE countries reported that they work with indigenous peoples.
- Regardless of respondent sector, biodiversity region, or level of economic development, local communities were the stakeholder group most commonly engaged in tree conservation activities.

> **Q7 Synopsis:** Protected land managers (public lands) and local community stakeholders are reportedly the two groups people collaborate with the most in conservation practices.

Q6 and Q7 Resources: Collaboration and Networking

- [ArbNet's Morton Register of Arboreta:](#) A global a listing of 1500+ arboreta/gardens to support collaboration, networking
- [BGCI Garden Search database:](#) Research gardens to learn more about their facilities, capacity, and interests
- [American Public Gardens Association (APGA)](#)
- [Botanic Gardens Conservation International (BGCI)](#)
- [Center for Plant Conservation (CPC)](#)
- [U.S. Forest Service (USFS)](#)
- [African Botanic Garden Network](#)
- [Botanic Garden Networks in Asia (Several)](#)
- [Botanic Garden Networks in Latin America and the Caribbean (Several)](#)
- [The European Botanic Gardens Consortium](#)