



vineland

RESEARCH & INNOVATION CENTRE



# **Urban Tree Value-Chain Research Priority Setting Workshop**

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**Report on the Findings**

**February 2021**

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## About Vineland

Vineland Research and Innovation Centre (Vineland) is a not-for-profit organization that focuses on research for horticulture in Canada with a vision of creating a vibrant, prosperous, and sustainable horticulture industry. Vineland recognizes that plants and soils are the fundamental components of a living green infrastructure that delivers environmental, economic and social benefits. Our Innovation Strategy and Research Program structure at Vineland reflects our commitment to supporting the value-chain to tackle the challenges and opportunities.

The Plant Responses and the Environment program is one of the five research programs at Vineland. A pillar of the Plant Responses and the Environment program is to enhance evidence of horticultural products as natural solutions through active experimentation, testing and demonstration. To address this, Vineland works with partners across Canada and develops models and specifications to improve the performance of vegetation and green infrastructure design to ensure lasting impact for the industry.

For more information and to stay up-to-date on current and upcoming research, visit and register at [greeningcanadianlandscape.ca](https://greeningcanadianlandscape.ca).



## Overview

The increasing demand for nature-based climate solutions represents a significant opportunity for the entire urban tree value-chain. This growing demand, however, has pointed to a critical gap in identifying and addressing research needs amongst stakeholders represented in this very diverse group.

Simply stated, there are numerous environmental challenges that affect the long-term health of urban forests. Vineland has already undertaken steps to address some of the key research priorities of the value-chain. However, increased demand for applied research-based solutions from several sectors within the value-chain has highlighted the need to develop a more collaborative model for research that connects, and is supported by, stakeholders throughout the entire value-chain.

In short, a new research approach is needed to support the urban tree value-chain in Canada. As a starting point, we have identified key objectives for a new research-funding model in order to define and critically evaluate the candidate models' suitability with respect to industry needs.

To achieve these objectives, Vineland has engaged in an initiative to explore partnership models, which will map out and better connect the entire value-chain. The outcomes of this initiative will allow for greater alignment of research priorities, potential for co-funding, greater transparency and communication about market trends, and new opportunities that result from government policy initiatives on issues such as climate change and green infrastructure. Ultimately, we have determined that the use of Consortium Research is the most effective model and propose the **Greening the Landscape Research Consortium** as an innovation hub for the urban tree value-chain.

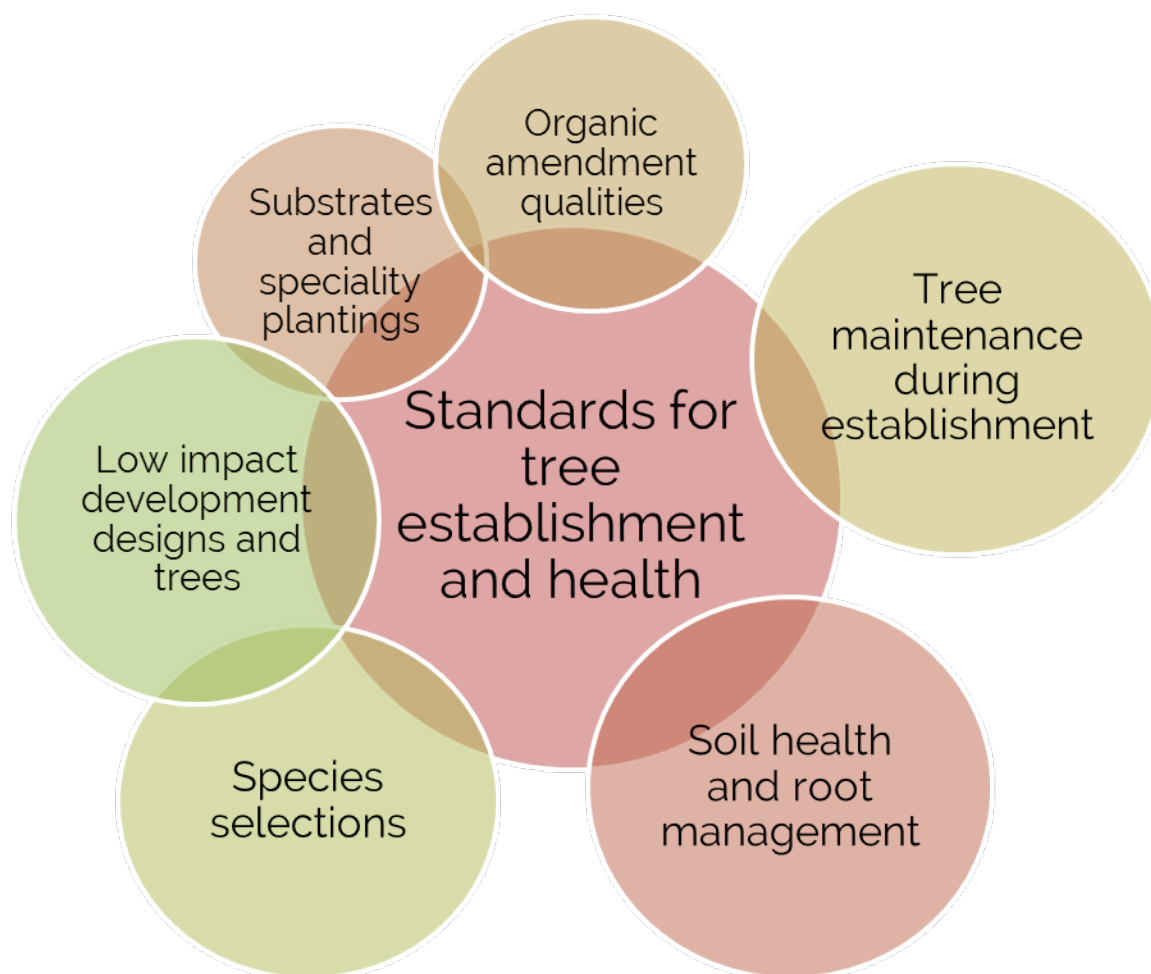
On February 9th 2021, Vineland hosted a virtual research priority setting workshop for the Urban Tree Value-chain supported by Agriculture and Agri-Food Canada's 'Canadian Agriculture Strategic Priority Program'. The workshop was facilitated by James Allen from Creative Huddle and attended by participants from across the Canadian urban tree value-chain. In total, there were 50 participants in attendance for the workshop. The full list of participants and their affiliations can be found in [Appendix A](#), but in brief, participants included people from various actor groups including nursery producers, landscape contractors, landscape architects, landscape designers, municipalities, nursery-landscape associations, as well as representatives of Vineland's project team.

The purpose of the workshop was to bring together actors across the value-chain to identify research priorities for the near and long-term future and engage in discussion on how to make the research consortium model function in such a way as to effectively tackle the priorities identified.

In this report we provide the results from the workshop as well as our proposed next steps to support the proposed Consortium Research.



## Research Priorities



**Figure 1.** The common research needs that Vineland has identified as areas of focus for the Urban Tree Value-Chain. The size of the spheres provides rough indications of the relative importance of the research topics across the value-chain and overlapping spheres indicate where there are areas of coinciding interest between topics.

Ahead of the workshop, participants received an information packet, which included background information about the project as well as an overview of the research priorities we had identified for the urban tree value-chain (**Figure 1**). In the first breakout session, workshop participants were placed in discussion groups according to their role within the value-chain (i.e. their actor group) and asked to provide responses to a series of discussion questions relevant to these identified research priorities, recording key points on a designated virtual discussion board (see [Appendix B](#)). There were seven groups in total, two nursery producer groups, one landscape supply group, three municipality groups and one group comprised of consultants and designers. The tasks presented to each group are outlined in 'Overview: Breakout Session 1' box below.



## Overview: Breakout Session 1

**Task 1:** Reflect on the research priorities presented and consider the following questions:

- Are there any priorities missing from the list?
- Are there priorities you disagree with on the list?

**Task 2:** Ranking of the list by urgency for your sector (summarize any areas of disagreement). Consider the following questions to make your ranking:

- What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?
- What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (i.e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others?)

## Ranking of Research Priorities

To determine the top research priorities, we reviewed the discussion boards and notes generated by the seven breakout groups. Four of the research priorities presented in **Figure 1** were discussed in detail by the groups. The three remaining research priorities, Low Impact Development, Organic Amendments and Specialty Substrates, were consistently not included in the groups' rankings, were not discussed at all and/or were included in the discussion as sub themes of the other research priorities.

Three central research priorities emerged from Breakout Session 1. Based on the rankings assigned by the seven groups, the order of research priorities as ranked by participants is as follows:

1. Tree maintenance during establishment
2. Soil standards for tree establishment
3. Nursery soil health and root management

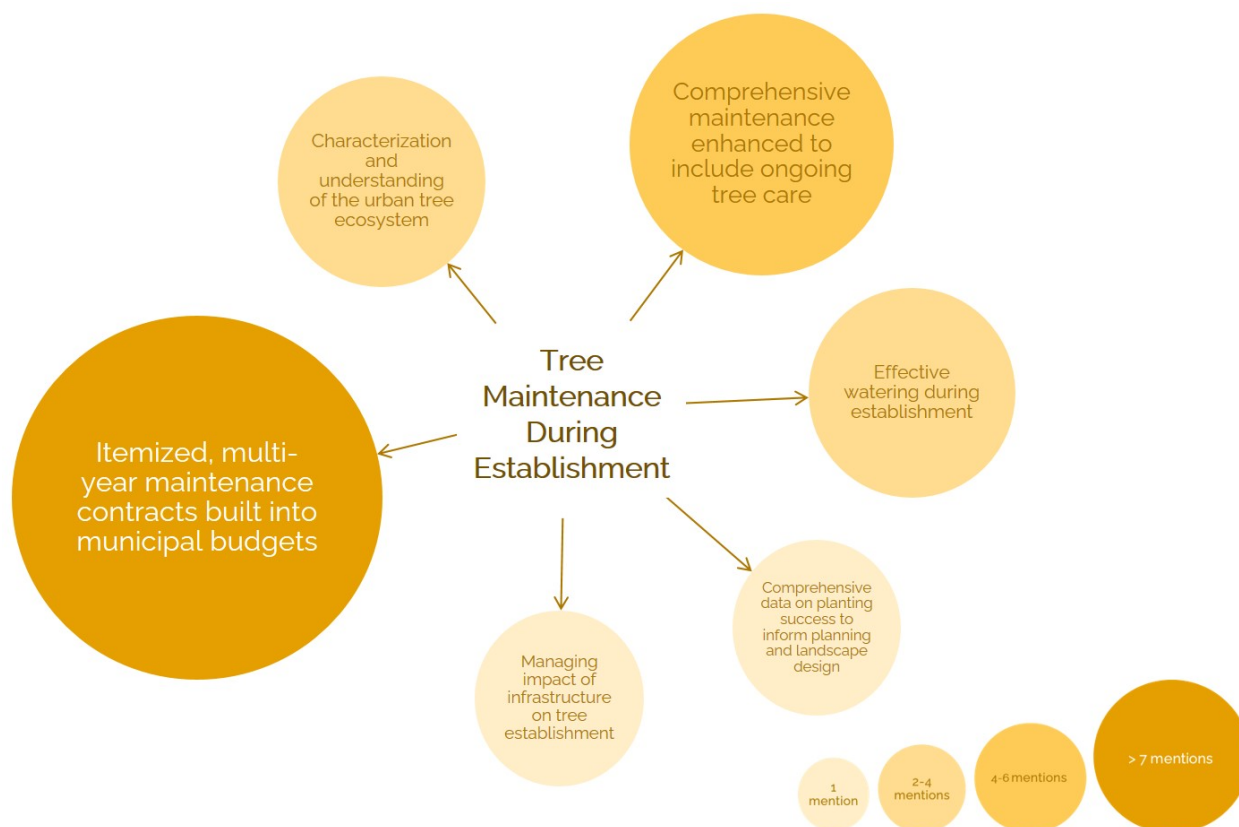
## Research Priority Sub Themes

Important subthemes for each of the priorities emerged during the first breakout session. In order to capture those subthemes and assign a relative importance ranking to them, we have created **Figures 2-5**. These figures depict the top four research priorities as ranked by workshop participants. To analyze discussion outcomes (located in [Appendix B](#)) we reviewed each of the discussion boards from Breakout Session 1. Vineland team members also provided their own notes taken during the discussion which offer context and in some cases, additional mentions of sub themes within each priority area.

Based on the discussion boards and notes, we assigned a rank to the sub themes according to the number of times each sub theme was mentioned. The figure depicts the sub themes as ranked by mention; the larger and darker the bubble, the more mentions the sub theme received. Where Breakout Session 1 one was centered on generating discussion amongst



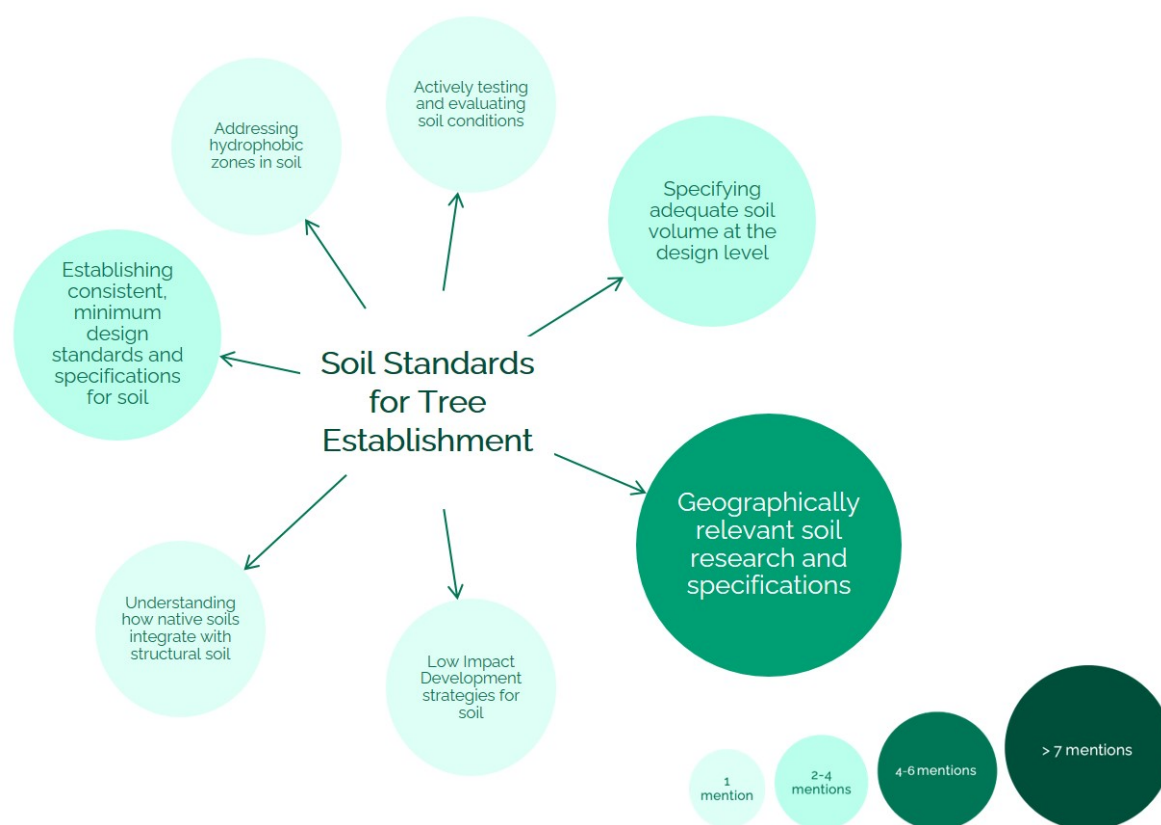
participants within a given sector, highest ranked sub themes reflect ideas and interests that were raised not only more frequently but more consistently across sectors and constitute shared and common interests relevant to the entire urban tree value-chain.



**Figure 2** Highest ranked research priority area, Tree Maintenance and Establishment with sub themes identified during discussion ranked by number of mentions.

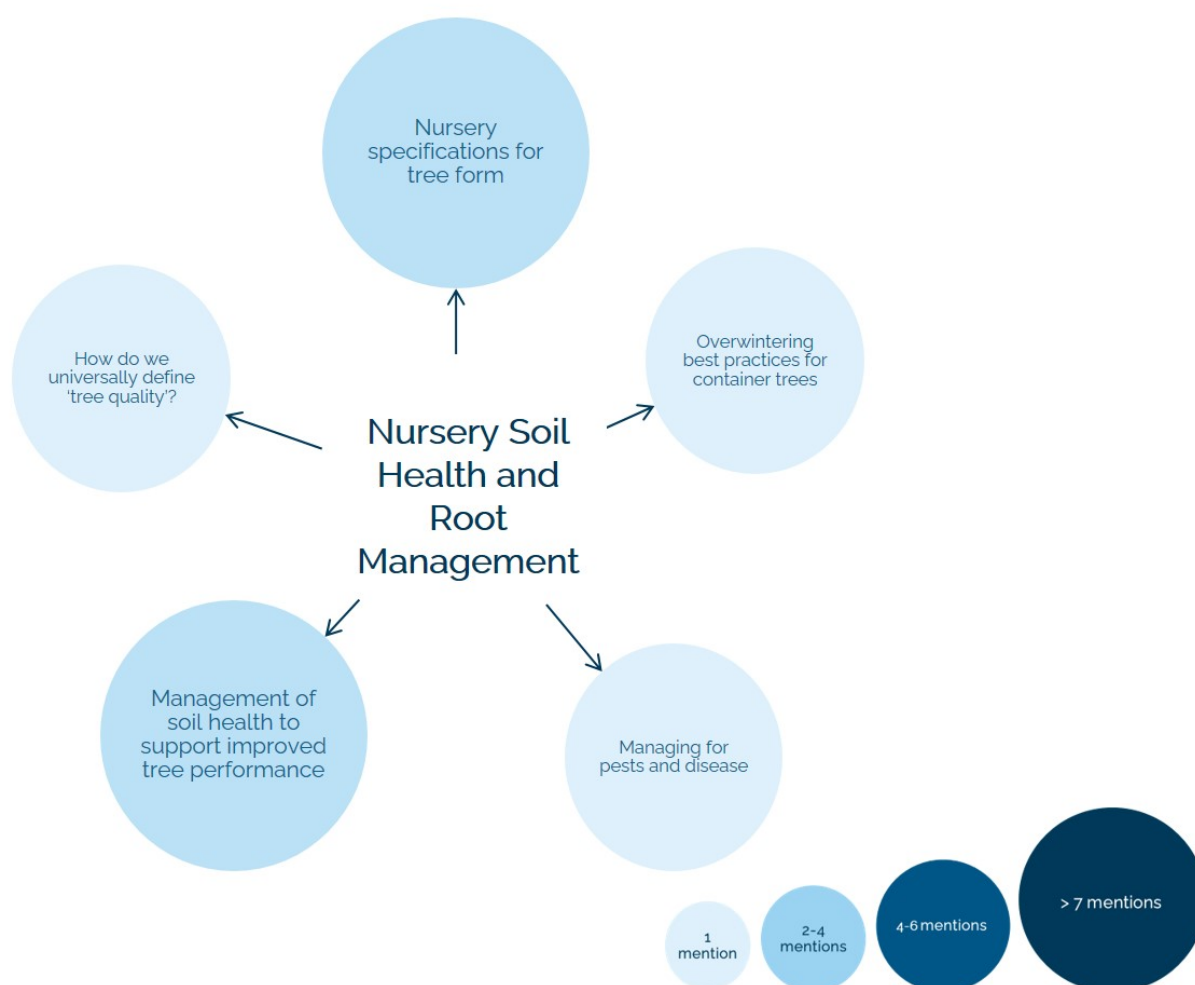
Tree Maintenance and Establishment was the highest ranked research priority area. Six sub themes emerged in the discussion with “*itemized, multi-year maintenance contracts built into municipal budgets*”, receiving the most mentions across and within discussion groups (>7 mentions). Other sub themes that emerged included mentions of specific areas of need related to tree care as well as mentions of “*infrastructure*” and “*landscape design*”.





**Figure 3** Second highest ranked research priority area, Soil Standards for Tree Establishment with sub themes identified during discussion ranked by number of mentions.

Soil Standards for Tree Establishment was the second highest ranked research priority area. Seven sub themes emerged in the discussion with “*geographically relevant soil research and specifications*” receiving the most mentions across and within discussion groups (4-6 mentions). The next two sub themes that received the most mentions both also mention specifications in some capacity, such as “*specifying adequate soil volume at the design level*” and “*establishing consistent minimum design standards and specifications*”. Of note here, is that “*low impact development strategies for soil*” was mentioned as a sub theme for this research priority (1 mention) but was not discussed by any of the groups as an individual research priority even though it was presented as such (**Figure 1**). Although low impact development is a burgeoning area of research and technical practice, the participants identified it as a component of an improved soil standard for trees and not a stand-alone research priority area.



**Figure 4** Third highest ranked research priority area, Nursery Soil Health and Root Management with sub themes identified during discussion ranked by number of mentions.

Nursery Soil Health and Root Management was the third highest ranked research priority area. Five sub themes emerged in the discussion. The most highly discussed sub themes, “*nursery specifications for tree form*” and “*management of soil health to support improved tree performance*” each received 2-4 mentions.



**Figure 5** Fourth highest ranked research priority area, Tree Species Selection with sub themes identified during discussion ranked by number of mentions.

Tree Species Selection was ranked fourth of the seven identified research priority themes. It was discussed by two groups, however the resulting discussions as demonstrated in **Figure 5**; were far less focused than that of the other priority areas, with many sub themes emerging and fewer overall mentions per sub theme. This suggests that further narrowing of informational needs and priority areas is necessary to determine what evidence gaps are lacking.

## Implementing the Value-chain Approach for Research

In the second breakout session, discussion groups were designed to facilitate more diverse and integrated priority setting, by mixing the various actor groups and ensuring the entire value-chain was represented in each designated group. There were six groups in total. Each group was assigned one of the top three research priorities that emerged during the first session whereby two groups were assigned to discuss one of (i) Tree Maintenance During Establishment, (ii) Soil Standards for Tree Establishment or (iii) Nursery Soil Health and Root Management. The tasks presented to the groups for discussion are outlined in the 'Overview: Breakout Session 2' box below.

## Overview: Breakout Session 2

As was mentioned in the introductory presentation today, a key barrier to the success of research in the urban tree value-chain is the fragmentation among value-chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector. A key objective of this workshop is to advance from conversation to action. Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

**Task:** Trace the research priority across the value-chain.

- What are the primary informational needs related to this research priority? Where do they exist on the value-chain?
- What have been the challenges and/barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value-chain?

## Results

In order to better understand the commonalities of what is needed for a value-chain collaborative research approach, the informational needs, challenges and barriers and indicators of success as identified by the groups were summarized and sorted. Within each research priority area, we identified the overarching emergent **Objective** presented by the discussion groups. We then identified the **Outputs** needed and finally the purpose or **Application** of said outputs. Where participants identified informational needs that have already been addressed either in the scientific or technical literature, we note the need for improved access to information to support the dissemination of data and resources that are not lacking but are perhaps inaccessible to the value-chain. The results of this filtering exercise can be found in **Figure 6** (whereas the unfiltered discussion boards can be found in [Appendix B](#)).







**Figure 6** Diagram demonstrating the three priority areas with objectives, outputs and applications. The concepts that emerged as central to themes and as indicators of success appear in the centre overlapping the research themes in the figure. Outside of the radial Venn diagram are the other informational needs that emerged during the discussion.

Breakout Session 2 was centered on generating discussion on the top three research priority areas. In many instances, ideas from each of the categories (informational needs, challenges and barriers and success) were raised frequently and consistently across research priority themes. These ideas constitute shared and common interests relevant to the entire urban tree value-chain with respect to implementation planning.

The centre of the diagram therefore represents informational needs that were shared across all three research priority areas. These were also the ways that groups variously defined what “success” would look like for the value-chain if the objectives were achieved. “*Geographically relevant understanding of soil and tree performance*” was mentioned in both Breakout Sessions 1 and 2 as well as multiple times within and across individual group discussions. It appears to be a central indicator of success as defined by the workshop participants. “*Education and strategies for disseminating information*” was also central to many discussions in both breakout sessions and appears as another central idea underlying a successful value-chain research approach. Finally, “*characterizing cost-benefit*” and the value proposition associated with soils and trees, emerged multiple times in both sessions. It too appears as a central indicator of success according to workshop participants across all sectors.

Based on the information that emerged during Breakout Session 2, we identified the research questions that need to be addressed in order to achieve the objectives, outputs and applications that ultimately work towards those visions of success that were identified as central themes during the workshop.

## Research Questions

1. What are the critically important best practices for managing trees in the landscape during the establishment phase?
2. What are the key soil properties, quantities and qualities that are required to support long-term tree health?
3. What level of soil health improves tree performance and growth and how can it be achieved?
4. What production methods and handling practices create persistent high quality root systems?

## Summary

A recurring point made by many participants was the need to continue working in a collaborative fashion. Many participants pointed out how valuable the workshop discussions were and simultaneously noted how infrequently they had the chance to discuss topics with their colleagues across the value-chain. As the workshop ended, we polled the participants and asked if they would consider participating in a collaborative value-chain research model, such as the prospective Research Consortium. 96% of respondents answered favourably, indicating that they were interested in joining the proposed **Greening the Landscape Research Consortium**. Therefore, our intent, in addition to reporting on the workshop, is to move “from conversation to action.” In the next section, we outline a proposal to advance the needs expressed by participants by launching a collaborative research model in the near term to allow us to tackle the priorities they identified together as a value-chain.

## Contact

For more information on the project or next steps, please contact:

Darby McGrath

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## Appendix A – Workshop Participant List

Gerry Aubin	<i>Aubin Nurseries, MB</i>	Samantha Mulholland	<i>Jenkins Soil Mixtures , ON</i>
Dan Vanderkruk	<i>AVK Nursery, ON</i>	Vic Krahn	<i>Lakeshore Tree Farms, SK</i>
Dave Braun	<i>Braun Nurseries, ON</i>	Joel Beatson	<i>Landscape Alberta, AB</i>
Deb Veccia	<i>Chatham-Kent , ON</i>	Jan Loner	<i>Landscape Nova Scotia, NS</i>
Chris Decaire	<i>Chatham-Kent , ON</i>	Tony DiGiovanni	<i>Landscape Ontario , ON</i>
Steve Robinson	<i>City of Burlington, ON</i>	Jason Kropf	<i>Moser Landscape Group, ON</i>
Timea Filer	<i>City of Guelph, ON</i>	Corey Burant	<i>Niagara Parks Commission, ON</i>
Crispin Wood	<i>City of Halifax, NS</i>	Case Vanderkruk	<i>NVK Nurseries, ON</i>
Kevin Osmond	<i>City of Halifax, NS</i>	Mark Vanderkruk	<i>NVK Nurseries, ON</i>
Heather Fraser	<i>City of Moncton, NB</i>	Paul Ronan	<i>Ontario Parks Association, ON</i>
Ray Vendrig	<i>City of Toronto, ON</i>	Dwayne Beck	<i>Parkland Nursery, AB</i>
Amory Ngan	<i>City of Toronto, ON</i>	Joe Klassen	<i>Purple Springs Nursery , BC</i>
Uyen Dias	<i>City of Toronto, ON</i>	Frank Burrows	<i>Saugeen Shores , ON</i>
Martha Barwinsky	<i>City of Winnipeg, MB</i>	Sandy Howkins	<i>Specimen Trees, BC</i>
Ron Koudys	<i>CLS, Landscape Architect, ON</i>	Sharon Johnsen Howkins	<i>Specimen Trees, BC</i>
Jamie Aalbers	<i>CNLA , ON</i>	Jeremy Johnson	<i>Town of Caledon, ON</i>
Mario Cramerstetter	<i>Cramer Nurseries, QC</i>	Shannon McKay	<i>Town of Lincoln, ON</i>
Gerard Fournier	<i>CUFN - Prairies, SK</i>	Cody Brown	<i>Tree to Tree Nurseries, AB</i>
Anita Heuver	<i>Eagle Lake Nurseries, AB</i>	Alex Satel	<i>Urban Forest Innovations, ON</i>
Stan Kochanoff	<i>Environova, NS</i>	Philip van Wassenauer	<i>Urban Forest Innovations, ON</i>
Dave Sept	<i>Golden Spruce Nurseries, BC</i>	Erin Agro	<i>Walker Environmental, ON</i>
Christene LeVatte	<i>Highland Landscapes, NS</i>	Nicole North	<i>Walker Environmental, ON</i>
John Blok	<i>Horizon Landscape Contractor, BC</i>	Art Maat	<i>Wilco NW, AB</i>
Glen Manning	<i>HTFC Planning &amp; Design, MB</i>	James Lane	<i>York Region, ON</i>
Andrew Ronald	<i>Jeffries Nurseries, MB</i>		
Jaime Douglass	<i>Jenkins Soil Mixtures , ON</i>		



## Appendix B – Discussion Boards

### Breakout Discussion 1

#### Nursery Sector

**Research priorities**

Tree maintenance during establishment    Soil standards for tree establishment    Nursery soil health and root management    Species selection

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**Are there any priorities missing from the list?**

effective watering during establishment (frequency and quantity)    using adequate soil volumes in design    Tree Nursery specifications (e.g. buried root flares, branching structures, etc.)    species selection choices for design scenarios    matching tree species choices to project design & site conditions    evidence base on increased value of trees with trees    temperature and handling priority temperature during high heat    tree purchasing practices and volume of tree planting program    deicing practices effects on trees    how do we get soil that's not too salty?

contract monitoring    how do we define tree quality?    benefits selection for production and delivery that are viable in commercial production systems

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**Are there priorities you disagree with on the list?**

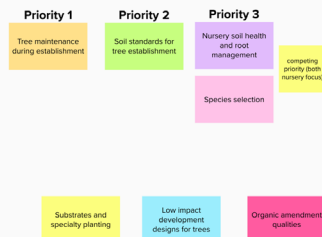
#### Ranking of the list by urgency for your sector Nursery Sector

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.



### Breakout Discussion 2

#### Research Priority: Tree Maintenance During Establishment

A key barrier to the success of research in the urban tree value chain, is the fragmentation among value chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector.

**A key objective of this workshop is to advance from conversation to action.** Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

**Trace the research priority across the value chain.**

- What are the primary informational needs related to this research priority? Where do they exist on the value chain?
- What have been the challenges and barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:

Resources/ Info Needs	Challenges	What Does Success Look Like?
Public education on many education to make next generation advocates	Who is responsible for establishment?	What does establishment, mean, how to define?
Who is responsible for maintenance after initial planting?	Education on what is required for establishment (eg. watering in the rain)	Establishment period list as 3 years
Where is information stored?	prioritize what can be done.	
What are the critical steps for ensuring success?	Lack of understanding of the value (among public) of tree establishment maintenance... how to overcome?	
"Smart irrigation" for watering and establishment		
Question of "how" - how much of what intervention/ maintenance action is required, and for how long/how many times? How long is the "establishment period"?		
Are there other things we are not doing to help trees in the establishment period that we should be doing?		
Public support (readiness to watering. Provide weather info to support tree healthy needs		
Keep maintenance records and expectations for watering. (Build into contract)		

## Breakout Discussion 1

### Nursery Sector

**Research priorities**

Species selection    Soil standards for tree establishment    Substrates and specialty planting    Nursery soil health and root management

**Are there any priorities missing from the list?**

research in to geographical species selection    New varieties of trees to replace those threatened by pests and diseases    New varieties for cold hardness    hydrophobic zones in soil    how native soils integrate with structural soils    Growing substrates with more biological activity    Overwintering container trees - when root is above ground    Interface better with LAs (engaging diversity in particular)    Growing substrates that help transplant success

**Are there priorities you disagree with on the list?**

### Ranking of the list by urgency for your sector

#### Nursery Sector

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (ie, how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.

**Priority 1 - Container substrates**

Developing better organic substrates with more biological activity

**Priority 2 - Transplant and Soils**

Container soils that marry with soils at transplant site

For field grown, nursery soils don't always mix well with those at transplant sites - hydrophobic zones

how native soils integrated with structural soils

**Priority 3 - Species selection**

Easy to grow species tend to be selected over diversity

New varieties for cold hardness and to replace species threatened by pests and diseases

## Breakout Discussion 2

### Research Priority: Tree Maintenance During Establishment

A key barrier to the success of research in the urban tree value chain, is the fragmentation among value chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector.

**A key objective of this workshop is to advance from conversation to action.** Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

**Trace the research priority across the value chain.**

- What are the primary informational needs related to this research priority? Where do they exist on the value chain?
- What have been the challenges and barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:

**Resources/info needed**

Creation of sustainable ecosystems in urban environments

sustainability policies for the long term in cities re trees

education on cost of the tree over the life span

beneficial soil organisms in cities for sustainable plantings and long term health

growing awareness among business sectors about the benefits of trees (and why trees etc)

more training on horticultural principles

invested elements helping to improve tree care

What about the value of arborist chips for mulch? Why isn't this better known?

**Challenges**

How can green infrastructure be sustainable without more intervention?

10% hold back before completion

maintainance period is insufficient?

budgets are not matched to tree care

How can municipalities create more value for long term maintenance?

**What does success look like?**

knowledge is effectively translated to networks

educated staff and common principles

"stewardship"

identifying co-benefits; social-ecological indicators are defined

tree care budget is matched to real long term costs

long term sustainability of trees, establishing metrics on "sustainability"

accountability, governmental or otherwise to evidence principles

## Breakout Discussion 1

### Municipal Sector

Research priorities

Soil standards for tree establishment

Species selection

Tree maintenance during establishment

Are there any priorities missing from the list?

Minimum design standards (Uniform)

Mislabelling and inventory

Root and hardscape conflicts (impact of infrastructure)

Where does economic benefit or cost fit in?

Are there priorities you disagree with on the list?

Substrates and specialty planting is lower priority

### Ranking of the list by urgency for your sector

#### Municipal Sector

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (ie. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.



## Breakout Discussion 2

### Research Priority: Soil Standards for Tree Establishment

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Trace the research priority across the value chain.

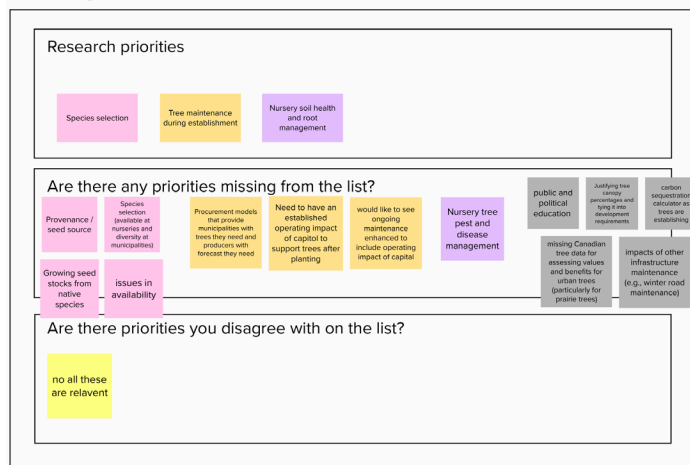
- What are the primary informational needs related to this research priority? Where do they exist on the value chain?
- What have been the challenges and barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:

Resources/ Info Needs	Challenges	What Does Success Look Like
<div>public education and lack of understanding of soil science (e.g. soil standards and specifications)</div> <div>understanding ranges, soil depths, and ultimate cut-offs for soil specifications--important for species selection</div> <div>We need test labs and knowledge for different sites</div> <div>reference manual for different sites and soil ranges</div> <div>soil volume requirements</div> <div>cost benefit analysis</div> <div>need to understand limit of standards and soil accumulation on trees (reduce impacts)</div>	<div>different standards across the nation</div> <div>old and outdated soil standards and specifications</div> <div>increases in cost (including soil cells)</div> <div>expensive</div> <div>historic sites and underground and site-specific challenges</div>	<div>getting municipalities and contractors to buy into the changes</div> <div>buy ins from different groups to improve soil quality and tree establishment</div>

## Breakout Discussion 1

### Municipal Sector



### Ranking of the list by urgency for your sector

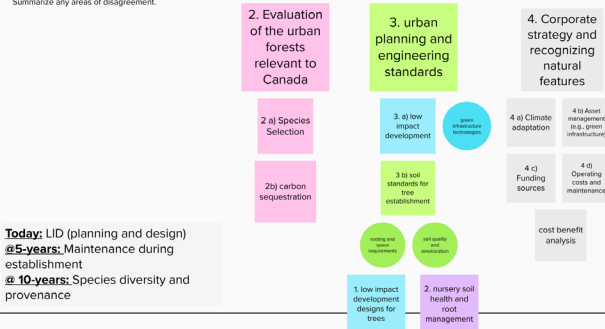
#### Municipal Sector

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

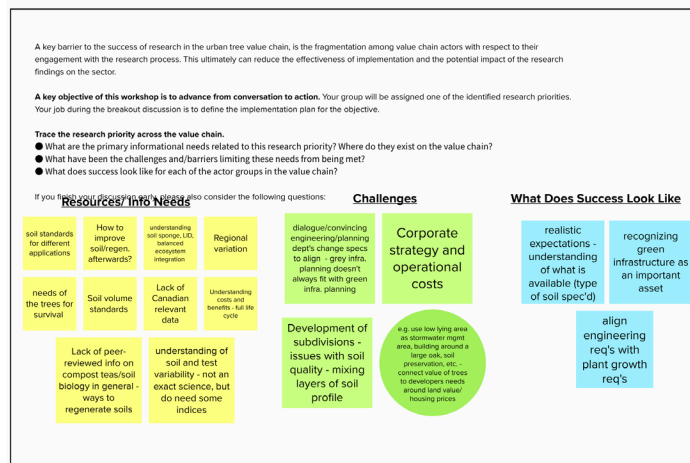
What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (i.e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.



## Breakout Discussion 2

### Research Priority: Soil Standards for Tree Establishment





## Breakout Discussion 1

### Municipal Sector

Research priorities

Substrates and specialty planting

Tree maintenance during establishment

Soil standards for tree establishment

Organic amendment qualities

Nursery soil health and root management

Species selection

Low impact development designs for trees

Are there any priorities missing from the list?

Problem with quality vs quantity (ie. nursery stock provenance)

Management of sustainable seed sources

Educate Developers to ensure the right species are being planted

Need to test the conditions (ie. working with Vineland)

Planting detail & specifications are not enough - toolbox needed

Geographic Specifications are important

Are there priorities you disagree with on the list?

### Ranking of the list by urgency for your sector

#### Municipal Sector

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (ie. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.

#### Priority 1

##### Soil Standards from a geographic context

Planting detail & specifications are not enough - toolbox needed

#### Priority 2

##### Species selection

Educate Developers to ensure the right species are being planted

## Breakout Discussion 2

### Research Priority: Nursery Soil Health and Root Management

A key barrier to the success of research in the urban tree value chain, is the fragmentation among value chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector.

**A key objective of this workshop is to advance from conversation to action.** Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

**Trace the research priority across the value chain.**

- What are the primary informational needs related to this research priority? Where do they exist on the value chain?
- What have been the challenges and barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:

**Resources/ Info Needs**

Does auguring cause root defects.

Hydrogel in the time of planting?

Soil needs oxygen and roots need oxygen to grow and have the tree establish

Where are we with myco. in the nursery? Is the soil already full of myco. already it is health? Does this depend on the nursery?

Container production trees, on-site dry out and in ground. Can't get the water on the roots quick enough and then they are difficult to re-wet.

Container grown trees, girdling, needs to be pruned. Ball needs to be corrected.

When purchasing nursery stock how do you know when the stock quality is good? If grown for a year in container then it will be influenced by the container.

Wire basket production, take an inch or two off the top to expose the first the root flare. Is this coming from the schools and new education power arch, asking for different practices compared to season arch). Could this be avoided with nursery practices.

**Challenges**

Disconnect on what is grown at the nursery and what is planted on site for soil quality

Japanese beetle control program requires close observation. Other nurseries can plant between the rows. This could avoid new with soil thrown on the root ball when cultivating

Bareroot trees nurseries have no seen a difference in previous trials. For smaller plants in propagation there may be a difference (thick soil media).

**What Does Success Look Like**

Good root systems first (below ground first, above ground second)

Soil at the nursery is important as it's going to the site. Does the soil have enough moisture to survive before irrigation. Don't plant in dry nursery soil to a sandy soil site or vice versa

Examples Alberta, city based soil. When a nursery buys from a grower based soil nursery and planted in Alberta there are huge losses. Trees get planted in topsoil based

One nursery switched over to all air-ground pots. Tested 10 to 15 pots to select the right on for the nursery



## Breakout Discussion 1

### Landscape Contractors & Soil Suppliers

**Research priorities**

Soil standards for tree establishment      Species selection      Tree maintenance during establishment

**Are there any priorities missing from the list?**

people who spec. LAs, urban planners, arborists – experts. Can't have an engineering firm doing this. Specs have to be on the authority of experts.

Trees could be best quality, but soil specs are essential.

canadian data for tree species / growth and values / benefits of urban forest

standardize the contracts to not have maintenance - multi year schedule

Maintenance is it a term should be paid that way

Such generic maintenance specs – no teeth, no authority within current specs to allocate a budget for follow up maintenance and inspection - systemic problems with old specs still using to this day.

other infrastructure maintenance impacts on urban trees i.e. winter road maintenance

read to about decision makers what money in maintenance contracts goes towards

always looked at changes growth as good indicator of establishment, but money don't

Soil Standards, more up to date specification that can be applied across a broad range of sites.

**Are there priorities you disagree with on the list?**

### Ranking of the list by urgency for your sector **Landscape Contractors & Soil Suppliers**

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? i.e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.



## Breakout Discussion 2

### Research Priority: **Nursery Soil Health and Root Management**

A key barrier to the success of research in the urban tree value chain, is the fragmentation among value chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector.

**A key objective of this workshop is to advance from conversation to action.** Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

Trace the research priority across the value chain.

- What are the primary informational needs related to this research priority? Where do they exist on the value chain?
- What have been the challenges and barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:

**Resources/Info Needs**

more research on what is a quality root system and how is it being produced; is it in Canadian nurseries?

**Challenges**

The soil quality assessment database: fragmented, needs integration, regional specification

Needs for regional soil research

Guidance for proper root pruning to improve root structure

Need to understand what is good quality root system; how to improve root quality; protocol on root system management for other sectors

Understand differences between container growing trees vs. planting on site

**What Does Success Look Like**

Improve the water and nutrient retention of the soil/substrate

compatibility between nursery soils and planting sites

soil health goes hand in hand with root systems; good soil going out in the root ball to help in a new environment

## Breakout Discussion 1

### Landscape Architects

**Research priorities**

Substrates and specialty planting

Soil standards for tree establishment

Tree maintenance during establishment

Species selection

Organic amendment qualities

Nursery soil health and root management

Low impact development designs for trees

**Are there any priorities missing from the list?**

Species selection is very important: the opportunity to create natural/aesthetic environment vs. just use whatever species they have

align the science concerning canopy targets with growing strategies

research into soil ecosystems and organisms in all the various ecosystems in the country

develop contexts that connect specifications, growing, installation, maintenance

promoting more realistic budgets for municipalities so that plant independence in the landscape can occur

Understanding the tree response: knowing the root cause, the above ground, the environment

Landscape architects don't know how to grow trees. Have an idea on the sustainability of the trees when design. Need research/data summary of the success rate of planting and/or replacement rate from contractors for the past 25 years.

Watering schedule may need to be part of the contract

Nursery production: issues, root quality, grafts, Procurement

establish close communication links between all players

Communication

**Are there priorities you disagree with on the list?**

many of these deal with soils which seems to duplicate issues

Nursery soil "health" and root management are distinct - should be separate research questions.

Need clarity on "substrates and specialty planting" - what does this mean?

### Ranking of the list by urgency for your sector

#### Landscape Architects

Consider the following questions to make your ranking:

What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?

What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (i.e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others.

Summarize any areas of disagreement.

#### Priority 1

Tree maintenance during establishment

Species selection

#### Priority 2

Soil standards for tree establishment

Organic amendment qualities

#### Priority 3

Substrates and specialty planting

#### Priority 4

Nursery soil health and root management

## Breakout Discussion 2

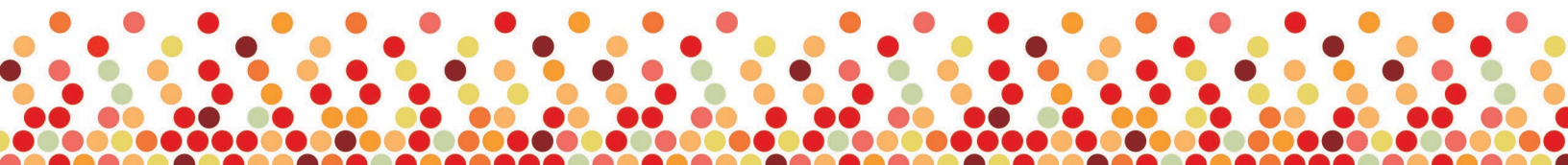
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- What does success look like for each of the actor groups in the value chain?

If you finish your discussion early, please also consider the following questions:



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