

Climate leadership competencies in public sector organisations in the Pirkanmaa region of Finland

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Abstract

Regions play an important role in concretising climate change mitigation and adaptation action. In this study, we asked those who work in designing and implementing climate strategies in regional public sector organisations in the Pirkanmaa region of Finland, for their views on what is needed for climate leadership in a regional organisation. We characterise the attributes of a climate leader in the context of regional public sector organisations in terms of the resources, processes, challenges and motivations in their work on climate change mitigation and adaptation, and describe the competencies needed for regional climate leadership. This research aims to support education design better to respond to the needs of regional climate actors.

Keywords: climate change education, continuous education, regional climate leadership

Introduction

Facing the challenge of climate change requires urgent action at all levels of society. While important agreements are negotiated at international and national levels, regions play an important role in concretising climate change mitigation and adaptation action (Galarraga et al., 2011). Climate change is a wicked problem where challenges are global, but actions are local. Regional decision-makers face challenges in implementing national targets to local actions (Burch,

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2010; Meerow & Woodruff, 2020). The Polycentric nature of climate action also challenges the traditional leadership structures and gives momentum for regional players to emerge (Dias & Antunes, 2024; Hofstad & Vedeld, 2021).

In 2019, the government set a target for Finland to be carbon neutral by 2035 and in 2022, a Climate Change Act was introduced requiring actions from municipalities. In 2020, the Pirkanmaa region made its own roadmap towards the climate neutrality target in 2030 (Hyttinen et al., 2020). Regional decision-making includes public and private organisations, designing and implementing climate strategies at different levels. In Pirkanmaa, several municipalities have committed to the carbon neutrality target by 2030, and parishes should, in principle, follow the Evangelical Lutheran Church of Finland's strategy to be carbon neutral by 2030. Pirkanmaa is the second most populated region in Finland, with more than 500,000 inhabitants (www.pirkanmaa.fi, accessed 20.8.2024). The region consists of 23 municipalities, out of which 12 are cities, it also has 24 parishes that all belong to the Diocese of Tampere.

Climate change mitigation and adaptation actions require expertise that is relatively novel to the education sector (Riuttanen et al., 2021). Earlier research has shown that professionals working with climate change mitigation and adaptation in society might not have any education on climate change in their background (Siponen et al., *subm.*). The same may apply to regional climate leaders who have grown to their positions from years of experience rather than being educated, motivated by personal values or by the requirements of the working environment (e.g. Carollo & Guerci, 2018). Climate change is proceeding at a fast pace and new information needs to be adapted to decision-making continually. As competencies needed to get through new climate actions in an organisation or with stakeholders are challenging, educational support might be needed.

In this study, we asked those who work as climate leaders (designing and implementing climate strategies) in public organisations in the Pirkanmaa region about their views on what is needed for climate leadership in a regional context and what motivates them to work on the climate goals. We also asked about what kind of goals they have and who has set them, what tools they have and what kind of education they have to support their climate work.

Our aim is to better understand the current developments and needs for competencies in climate leadership in regional organisations in order to develop higher as well as continuous education to support regional climate actors. Our main research question was: RQ) *What are the attributes of a climate leader in the context of local public sector organisations?* We explored answers to that question by the following sub-questions: SQ1) *What kind of climate change adaptation and mitigation processes do the organisations engage with?*; SQ2) *What are the*

challenges and motivations in operationalising these processes?; and SQ3) *What competencies seem most relevant for leading these processes?* Sub-questions 1–3 were utilised to construct a description of a regional climate leader.

Theoretical background

To successfully adopt climate actions into organisations, further resources are needed, such as strategies through which the concrete climate targets can be structured (e.g. Fekete et al., 2021), motivation and commitment to engage in such complex tasks (e.g. Afsam et al., 2020), and competent actors to execute different schemes and processes (e.g. Mochizuki & Bryan, 2015). These mentioned dimensions provided background to our study, in which we explored the practices, motivations, and competencies of the participating actors who were conceptualised as *climate leaders*.

In this study, we have studied climate leaders as persons who work on climate change mitigation and/or adaptation and exercise leadership within their organisations and posts, with an acknowledgement that the case organisations or people are not predominantly involved with solving climate change per se and that they have taken up the relevant activities typically as additional ones. Apart from these functions being extra-curricular of sorts, the agency-type nature of their actions was evident in the motivation and commitment to engage with these themes. In literature, *sustainability change agents* (e.g. Hesselbarth & Schaltegger, 2014) are seen as individuals in different roles who force changes by motivating others and removing the old unsustainable structures. *Changemakers* (e.g. Rivers et al., 2015) are motivated by their own values and take responsibility for making positive changes in society by utilising available resources proactively and collaboratively. *Change managers* (e.g. Gill, 2002) have a clear vision and mission for the future: to create a culture of change based on values and to develop strategies that motivates and empowers others to join. According to Akiyama et al. (2013), *environmental leaders* are thought of as community leaders who understand environmental boundaries and their systemic nature and are able to set clear priorities as well as to take relevant actions in collaboration with others regardless of possible uncertainties. *Environmental or green transformational leaders* (e.g. Nduneseokwu & Harder, 2023; Priyadarshini et al., 2023) motivate and inspire their employees to more environmentally friendly behaviour. These descriptions are created for sustainability or change leadership in general, and none of these describe the specific attributes of a *climate leader* (RQ).

According to Nye (2010), the requirement for an effective leader depends on the contextual processes, features, barriers and such. For example, for the capabilities (such as contextual intelligence) to develop, the constantly changing and unique culture of the organisation and the context in which it operates needs to be understood (*ibid.*). Studies by Nonaka and Konno (1998) and Scharmer et al. (2001) highlight that, for example, an organisation's temporal, spatial, and relational attributes are critical for the knowledge creation and action that can drive organisational transformation. Therefore, the context in which climate leadership competencies are practised, is of importance (RQ1). Research on climate change mitigation schemes, capabilities and processes on the local or municipal level has been conducted in recent years (e.g. Burch, 2010; Leck & Roberts, 2015; Meerow & Woodruff, 2020). Also, in Finland, the importance of climate leadership at the municipal level has been recognised (Merenheimo et al., 2020). Less focus has been paid to the leaders themselves and their educational needs in the context of local and regional decision-making.

The polycentric nature of climate governance calls for a new type of leadership that can be, for example, transformational and/or co-creational (Hofstad & Vedeld, 2021). Regional decision-makers, specifically, are working at the intersection of both internal (or local) and external (or global) climate goals (Dias & Antunes, 2024). In practice, leadership is rarely tied just to climate-oriented processes but also includes general organisational processes, mixing the roles of a leader and a manager (e.g. Caldwell, 2003; Scharner, 2002). Overall, managing climate change is a challenging task for leaders, and a better understanding of the challenges and motivations supports the building of relevant continuing education for them (RQ2).

To best structure such education, a deeper understanding of the specific climate change competencies is needed (Riuttanen et al., 2021). Competencies are typically framed as a set of knowledge, skills, attitudes, and values applied for a certain purpose in a practical context (e.g. OECD, 2020). As a prevalent research topic in sustainability education and practice, competencies have found several different conceptualisations and utilisations (e.g. Rieckman, 2018; Leal Filho et al., 2020; Brundiens et al., 2021). To our study, the most relevant perspective is the utility of competency, meaning competency that captures the operational abilities, capabilities and/or qualities of an actor in relation to the specific tasks, processes, and/or aims for climate change mitigation and adaptation. A profound understanding of such climate leadership competencies is important for the successful execution of the global sustainability transformation (e.g. Fawzy et al., 2020) and for the leaders in general (e.g. Afsar et al., 2019) (RQ3).

Methods

This study was conducted among the participants of the Pirkanmaa Climate Leadership Forum and was initiated by the University of Helsinki, the Council of Tampere Region, the Diocese of Tampere and Centre for Economic Development, Transport and Environment of Tampere Region, which began the planning in 2020. The first forum was supposed to be held in spring 2021 at the University of Helsinki Hyytiälä Forest Station in Juupajoki, Pirkanmaa, Finland, but due to the pandemic, two online forums were held instead: January 2021 an online workshop sharing climate leadership visions, discussing the role of forestry, buildings and the economy as part of climate leadership; and June 2021 a virtual online event from Hyytiälä continuing discussions on leadership and forestry. The first on-site forum was held in April 2022 in Hyytiälä, where regional climate leadership competencies were workshopped. Invitees to the forums were municipal managers, environmental managers, leading ministers of parishes, as well as trustees working on climate topics either in leadership or expert roles in the Pirkanmaa region.

This research was structured as a Delphi-style study (see Osborne et al., 2003; Brill et al., 2006) with three consecutive research stages, each analysed through a directed content analysis (Hsieh & Shannon, 2005). The Delphi method is commonly thought of as a technique where a group of experts collaboratively and iteratively discuss a complex issue (e.g. Rowe et al., 1991). Delphi-style methodology, which has also been utilised in educational research for curriculum and learning outcome development (e.g. Clark et al., 2020; Seo et al., 2020), was chosen for two reasons: 1) the expert information among the selected participants was thought to best develop through a more reciprocal process – resulting in a deeper (rather than wider) insight, and 2) the three-stage scheme brought about three areas of results with a respective focus built upon each previous stage.

The three-stage material collection and analysis process is presented in Figure 1. In the first stage, a questionnaire focusing on SQs 1–3 was sent to the participants of the June 2021 online event and a content analysis was carried out on the collected responses. In the second stage, the scheme of competencies constructed from Stage 1 responses, focusing on SQ3, was workshopped with the Spring 2022 workshop participants. In the third stage, the initial analysis of the study was presented to the participants of the first two stages, and reflections to suggest a step forward in conceptualising the public organisation climate leader attributes were collected via email, aiming to answer the main RQ. The authors and investigators of this study acted as facilitators of the phases but did not add to the material as participants of the study *per se*.

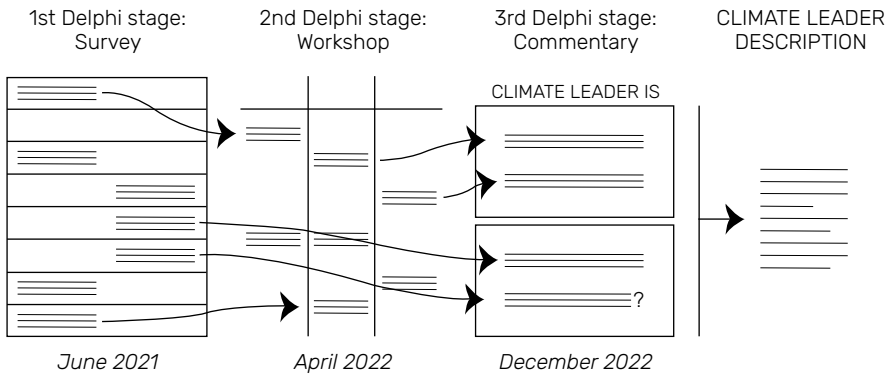


Figure 1. Delphi method stages in the study.

Results

Stage 1: Questionnaire

In the first questionnaire, we asked: 1) the actions taken by the respondents' organisations in preparing for climate change mitigation and adaptation, 2) what goals they have and who has set the goals, 3) what competencies are needed in the organisation to reach these goals, and what are the biggest challenges, 4) the respondents' personal role: competencies, challenges and motivation. 5) the competencies of a climate leader in their field, and asked them to name one climate leader, and 6) climate data and tools they use or need, as well as education needs. Question 1 included a list of potential actions, with an opportunity to add on, and other questions were open-ended.

In total, 14 respondents answered the first questionnaire, representing 11 different organisations in the region: one city, one municipality, one diocese and eight parishes. When looking at the operations taking place in the organisations, those representing the same organisations were counted as one reply. Sometimes, respondents had different ideas of the status of the actions, in which case their combined response was taken as 'I don't know'. Regarding other questions, having multiple replies from the same organisation was considered an asset and positively contributing to the depth of the results. Eight respondents answered from a position on the board / as a trustee, and six from an operational position. Nine identified themselves as leaders, and five as experts. All were involved in climate-related decision-making in their organisations.

Public sector climate operations

The questionnaire provided an insight into the represented public organisations' climate-related operations and resources. According to the responses, the organisations predominantly utilised national and international climate and sustainability schemes, such as *Carbon Neutrality 2030*, a common interpretation of the governmental commitment to becoming carbon neutral by 2035. Some represented organisations followed a similar scheme designed by the network of organisations to which they belonged. Thus, the implemented schemes were conceptualised externally to the specific organisation.

According to the respondents, many climate **operations** were already taking place or were in the planning phase in their organisations (Figure 2). Easy and cost-efficient actions, like recycling and improving energy efficiency, were already conducted in many organisations, whereas controversial topics like minimising driving private cars or compensating emissions were not even planned. Climate change mitigation actions, like energy renovations and changing to renewable energy sources, were more advanced than climate change adaptation actions: for example, taking insurance for the effects of climate change was not even planned in any of the organisations, according to the respondents. In addition to pre-defined options in the questionnaire, the respondents also mentioned the following ongoing climate actions of their organisations: climate certification processes, promoting climate-friendly dietary choices, and taking climate issues into consideration in forest management.

The respondents mentioned two types of **roles** in their organisations: a role *for utilising resources allocated for sustainability* and the *role of an agent*. Where the role of utilising available resources focused on executing the schemes and processes, the role of an agent consisted of functions ranging from researching, planning and suggesting climate-related changes to the organisation's practises to keeping other managers and actors of the organisation (and possibly the network of organisations) informed in climate issues. The role of an agent was also mentioned through the stated motivations attached to the role and functions of the representatives.

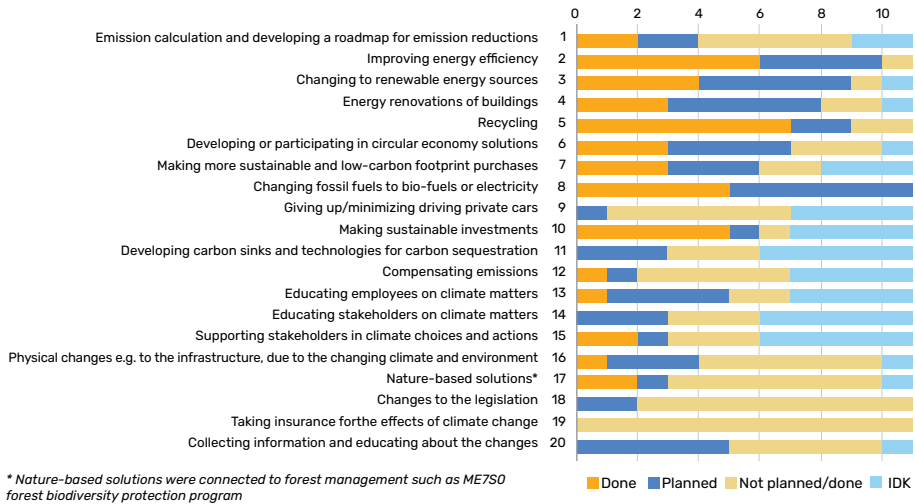


Figure 2. The status of the public sector climate operations in the organisations in the study was determined according to the 14 respondents to the questionnaire. Only one reply from representatives of the same organisations is included. In case they disagreed on whether action was taken or not, the response was included as 'I don't know' (IDK).

As **barriers** hindering climate work in their organisations, two types were mentioned: those related to managing others and processes and those related to resources. Motivating oneself or others was seen as a barrier, as well as easing any doubt. Often, sourcing and allocating new additional resources was seen as a barrier.

As **motivations** for climate action, the respondents mentioned the importance of saving the planet (especially forests, biodiversity and a clean environment were mentioned), responsibility and humans' role as protectors of the environment, and personal interest and the chance to have an influence.

Half of the respondents had no climate education. Three of the respondents had some formal education background related to climate change. Others had learned climate topics alongside their work in networks, forums and training organised by their own organisation. As **data sources and tools**, they mentioned the internet and their own material from their organisation, as well as news and blog posts, seminars and public discussion. They expressed a high interest in continuous education when it is presented in a compact and focused way.

As **climate leaders**, they named charismatic individuals who have talked publicly on climate issues. Also, organisations, namely the municipality of Ii and the Church Council, were mentioned, as well as persons in their own organisations who have advanced climate strategies and actions. No-one mentioned

themselves as climate leaders, even though they had been invited to the survey based on their leadership position or exemplary work on climate change.

Table 1. Resources and operations in Pirkanmaa climate work, based on Stage 1 survey responses.

Resources		Operations	
Organisational, national, and global environmental schemes	<ul style="list-style-type: none"> • Carbon neutrality by 2030 • National and international aims • National municipalities carbon-neutrality scheme • Climate certificate 	Investments	<ul style="list-style-type: none"> • Sustainable and low-carbon procurement • Sustainable investments • Organising climate education
Materials, tools, and other resources	<ul style="list-style-type: none"> • Schemes and guidelines • Available thematic knowledge and materials • Shared best practices 	Future development	<ul style="list-style-type: none"> • Educating employees • Developing and participating in the circular economy
Daily activities / property management	<ul style="list-style-type: none"> • Energy efficiency • Renewable energy sources • Recycling • Bio-fuels and electricity 	Motivating/ managing self and others	Drive organisational commitment: <ul style="list-style-type: none"> • Collaboration, conversation and compromises • Individual (re)solutions towards the aim • Getting the team to take issues seriously
Sourcing and allocating new resources	<ul style="list-style-type: none"> • Better allocation of resources • Knowledge of alternatives and well-accepted facts • Time for stakeholder engagement • Economic challenges • Lack of resources and commitment 	Agency over barriers	<ul style="list-style-type: none"> • A chance to make a difference • Human responsibility to nurture earth • Responsibility over decisions • To make commonly agreed goals relevant • Confidence to make the right decisions

Stage 2: Workshop

In the workshop, a schematic representation of climate leadership competencies, based on Stage 1 answers, structured as 1) organisational, 2) individual, and 3) leader's competencies, was presented to the participants ($n = 27$). Participants were divided into six groups of four to five persons with as diverse backgrounds as possible. They were asked to discuss the competencies presented in the scheme, add on if needed, and mark the three most important elements in the scheme distributed to them on paper. Each group had a facilitator who took care of the groups and followed the instructions in the 45-minute group work session, and a balanced opinion was formed and marked down clearly.

Participants of the workshop were mostly the same as the attendees of the first online forums, representing experts, leaders and decision-makers from five municipalities, one city, five parishes, and three regional organisations in Pirkanmaa. Everyone participating in the workshop permitted to use their contributions for research purposes.

Competencies

Three types of competencies revealed through the questionnaire in Stage 1 were classified as most relevant: 1) those that revolve around qualities to suggest and execute changes, 2) those that enable collaboration and delegation, and 3) those enabling one to invoke commitment (Table 2). In addition to the ranked competencies, some new topics emerged in the workshop and were added to the listing.

Table 2. Climate leadership competencies recognised by the participants of the study. The recognised competencies from the replies to the Stage 1 survey were categorised into three classes in the first column. The number of times the competencies in the class were voted as one of the most important in the workshop were marked in brackets in the second column. New additions arising in the workshop in Stage 2 are marked with *italics*. The last column represents wordings of the recognised competencies by the authors after Stage 2.

Main classes	Voted competencies	Wordings by authors
Qualities to suggest and execute changes	<ul style="list-style-type: none"> • Courage to act in new ways – ability to envision (6) • Ability to adopt new courses of action (5) • Tolerance of uncertainty (2) 	Ability to act in new ways with courage when facing uncertainty
	<ul style="list-style-type: none"> • Ability to evaluate means and implement solutions (5) • Ability to link actions to the bigger picture (3) • Understanding of the impacts of actions (2) • <i>Ability to utilise energy solutions locally to transition out of fossil energy (1)</i> • <i>Future working skills (1)</i> 	Ability to evaluate solutions and their impacts, and ability to execute them
Competencies to collaborate and delegate	<ul style="list-style-type: none"> • Staying up-to-date, learning and familiarising (5) • Expertise (2) • Broad vision and competence – basic and climate knowledge (1) 	Ability to stay up-to-date with current knowledge and update one's expertise continuously
	<ul style="list-style-type: none"> • Collaboration (7) • Conversational and negotiation abilities (4) • Ability to compromise and optimise (2) • <i>Networking – utilising experience</i> 	Ability to collaborate, negotiate and compromise
Invoking commitment	<ul style="list-style-type: none"> • Ability to utilise expertise (5) 	Ability to utilise expertise
	<ul style="list-style-type: none"> • Humility (5) • <i>Alleviating fears</i> 	Being humble
Invoking commitment	<ul style="list-style-type: none"> • Engaging and motivating others (6) • <i>Implementing changes in ways of thinking</i> 	Ability to engage and motivate others to act and think in new ways
	<ul style="list-style-type: none"> • Commitment of leaders (4) • Understanding of leadership in climate issues (2) 	Ability to get leaders committed and understanding of leadership

Stage 3: Statement and reflections

In the last Delphi stage, we asked the participants of the earlier stages for a commentary on a description of a public sector organisation climate leader, constructed along the previous phases of the study. The description was constructed by the authors to capture the analysed and grouped main findings of the workshop and questionnaire: the competencies of the climate leaders and their organisation's climate-related processes (SQ1–3). The suggested statement of the climate leader's attributes and functions was sent to the respondents as an online workshop where the statement (see Table 3) was presented and explained and then divided into a few separate sections for comments and directed questions. Seven respondents participated in Stage 3 of the survey anonymously – no background information was collected, but the survey was only sent to the previous participants of the study.

Table 3. Stage 3 study conceptualisation of a regional public organisation climate leader. The statement was sent to the participants for online comments, and a final description was defined based on the feedback.

Statement	Participant feedback	Climate leader description
Climate leader is an actor who motivates and invokes commitment, sources and operationalises changes, by leading and in collaboration	<ul style="list-style-type: none"> • <i>studies and maps relevant and affecting issues and opportunities</i> • <i>learns and reflects by doing</i> • <i>shares successes and encourages</i> • <i>listens to the local communities and needs</i> 	Climate leader is a knowledgeable actor who collaborates, motivates and invokes commitment, sources and operationalises changes, by leading, learning, and listening.
utilising their own and the organisation's climate strategies, tools, materials, and other resources, in operations, investments and resourcing for the climate.	<ul style="list-style-type: none"> • <i>ensures sufficient competence at the organisation</i> • <i>nurturing climate values</i> • <i>utilising the organisation's impact</i> • <i>replicating acts at national and global levels</i> 	They develop their own and the organisation's climate values, tools, materials and resources, for daily operations, investments and resourcing, in actions for climate by the local, national and global strategies.

All respondents generally agreed with the included attributes of the leaders. One respondent pointed out the importance of the leaders' own attained and updated knowledge and capabilities on which their climate leadership relies.

Furthermore, when commenting on the importance of the recognised, or absence of some missed attributes, one respondent added that the leader ought

to understand and engage with their local context. Another respondent added that it is important for the leader to share (internally) the progress and successes (in the climate-related functions) and thus encourage others in their work as well. When asked how and where these attributes are learned, three respondents suggested they should be part of education and academia, whereas five suggested they should result from work as *'learning-by-doing'*, *'in collaboration'*, and *'through networks'*. One respondent suggested that *'leadership skills are pretty much universal, and independent from what is being led'* and continued; that *'however, expertise and motivation (for climate leadership) has to be obtained from somewhere'*. One respondent noted the importance of engaging with *'forums where one gets to exercise their thinking'* and that *'it is typical for climate leaders to serve as trustees in different organisations'* – thus, *'it is important to include climate issues to their training and induction'*.

Generally, the leaders agreed on the suggested functions. When asked to prioritise the suggested resources, most of the respondents (n = 4) stated that *'the mindset'*, *'motivation'*, *'expertise'*, and *'climate knowledgeability'* were the most important. Importantly, all of these competence-oriented capabilities (related to knowledge, skills, and attitudes), were suggested as shared resources; in the mindset involving *'citizens, the whole organisation, and customers'*; where the motivation was also suggested as a shared resource or a reciprocal function in *'thinking in a group does emphasise one's own motivation'*; where the expertise was suggested in form of *'expert staff'*; and lastly; the climate knowledgeability was assigned to the *'key members of the organisation'*. Other suggested top-priorities were to have enough working hours resourced for these functions, as *'having enough time enables several other key resources'*, and having the correct tools in general to further and support the climate functions.

When asked for potential missing resources from the conceptualisation, the respondents suggested such elements as *'collaboration'*, *'scientific knowledge'*, *'values'*, and *'utilising one's potential influence'*, which, however, were already included in the presented climate leader conceptualisation. Lastly, the leaders were asked to reflect on whether the suggested attributes and functions seem sufficient for furthering the organisation's climate-related efforts, to which the respondents generally agreed. However, a few notions were added, such as that these seem *'sufficient under the condition that there are enough time/working hours resourced'*, and that *'for these activities to have a wider impact they need to cause ripples on a national and global scale'*, or thinking of all of these in the context of, *'concrete acts'*.

Discussion and conclusions

Respondents of this study, climate leaders in the Pirkanmaa region, described a regional public organisation climate leader as *a knowledgeable actor who collaborates, motivates, and invokes commitment; sources and operationalises changes by leading, learning and listening. They develop their own and the organisation's climate values, tools, materials and resources for daily operations, investments and resourcing in actions for climate by the local, national and global strategies (RQ).* A description is shown in Figure 3.

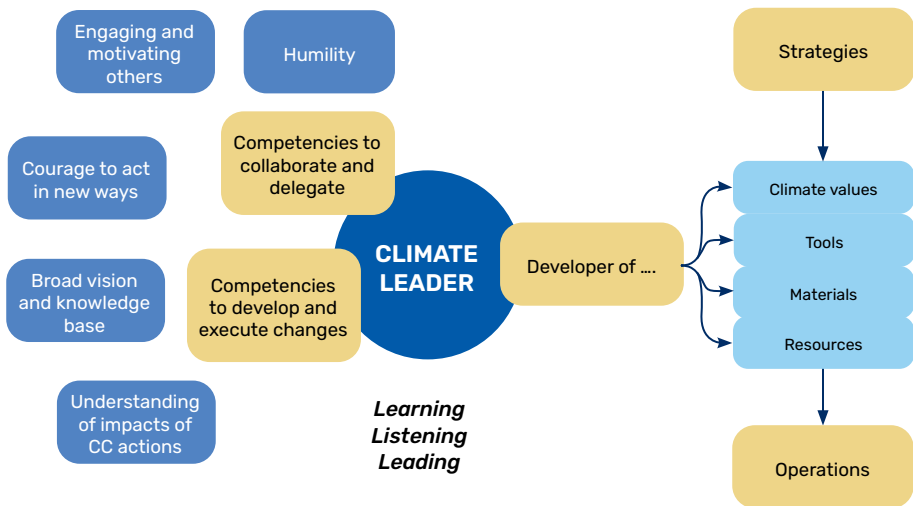


Figure 3. Visualisation of the regional climate leader description. Visualisation is constructed from the Stage 3 statement with some additional wording from earlier stages of the study.

Similarities can be found to the earlier described sustainability, environmental or change leaders, as contextually relevant knowledge was important to an environmental leader according to Akiyama et al. (2013), collaboration was highlighted by the change-maker description by Rivers et al. (2015) in addition to a strong value base, and motivating others was found to be important to sustainability change agents by Hesselbarth and Schaltegger (2014) as well as environmental transformational leaders (Nduneseokwu & Harder, 2023; Priyadarshini et al., 2023). Values and empowering others were important elements of a change manager's description by Gill (2002). The ability to utilise available resources was mentioned by Rivers et al. (2015) and strategies by Gill (2002), as well as the ability to put things into action by Akiyama et al. (2013).

Strong leadership skills were highlighted in the description, and especially leadership styles that are collaborative and listening (Hofstad & Vedeld, 2021), but also managing operations effectively was seen as a core competence of a climate leader (Caldwell, 2003; Scharner, 2002). Respondents noted the challenge of leading in the intersection of both internal/local and external/global goals, as described by Dias and Antunes (2024).

Many climate operations were already taking place or were in the planning phase in the organisations (SQ1). Easy and cost-efficient actions, such as recycling and improving energy efficiency, were already conducted in many of the organisations, which could reflect the goodwill of the organisations for climate work. Mitigation actions were more advanced than adaptation actions. However, only two out of 11 organisations in the study had done emission calculations and developed a roadmap for emission reductions, which could reflect the need for leadership. Also, collecting information and educating about the changes as well as informing stakeholders on climate matters, were planned by some of the organisations but not done in any of them, according to the respondents, which could also reflect upon the lack of climate leadership.

The main challenges to regional climate action were seen in resources and leadership (SQ2). Respondents had a personal motivation for climate action based on their values and saw this as an opportunity to have a real influence on creating a better world (SQ2). In future studies, it would be interesting to explore how the climate leadership competencies are operationalised to overcome the challenges, how the leaders are able to shape their organisations, and how the interaction between the leaders and their organisations evolves over time.

Being or becoming a regional climate leader requires a versatile and demanding set of competencies (SQ3). The regional climate leader description reflects the importance of the following competence areas of climate leadership: 1) **knowledge**: wide expertise in climate change topics, as well as leadership, and a continuous learning of them, 2) **skills**: collaboration skills and change leadership, 3) **attitudes**: respectful and humble, but also visionary and determined, and 4) **values**: strong climate value base. Compared to other climate competence frameworks, similar topics were found in the climate expert competencies studied by Siponen et al. (submitted) in Finland, climate adaptation competencies explored in Canada (Pruneau et al., 2013; Cox et al., 2020) or the general key competencies of sustainability (Brundiers et al., 2021). As competencies get their functionality in a certain context and purpose, the context-specific wordings of this study have their utility to the public sector climate actors. Implementing these competencies in public sector organisations might be challenging, as the set might be seen as too demanding for an

individual to reach. However, competencies can be thought of as institutional or collective, where individuals with different sets of competencies complement each other. Also, as previously mentioned, a lack of resources challenges the capacity building in public sector organisations. Competencies needed for climate leadership might also evolve over time as climate change proceeds and foci of regional climate action might change.

The sample of this study was limited to the participants of the Pirkanmaa Climate Leadership Forum and the overall number of respondents was small. However, they were very representative of the different public sector organisations in the Pirkanmaa region, and they were actively carrying out and leading climate work within their organisations. Due to our focus on the forefront of climate action and aim at collecting rich material, we did not seek leaders without interest in climate change, even though their education would be important.

Even though challenges vary between regions, i.e. related to impacts of climate change and other regional characteristics (e.g. Sotarauta et al., 2023), the overall need for climate action and change leadership is shared worldwide. Finland has set climate goals that are one of the most ambitious in the world (<https://eciu.net/netzerotracker>, accessed 16.8.2024), and the Pirkanmaa region is one of Finland's forerunners of climate action. Thus, we have studied forerunner organisations and people trying to drive change in unsustainable structures (Salovaara & Hagolani-Albov, 2024). When climate action in the future probably normalises and gets into every organisation's everyday strategies, the type and need of leadership might change due to changes in EU and national legislation. Finland is also a relatively stable society, where authorities are trusted, and impacts of climate change are relatively moderate. In some other contexts, for example, the importance of building trust and considering aspects of climate justice could be highlighted. Also, adaptation competencies and risk management could be more focused on contexts where climate change impacts are stronger.

Overall, this description provides a unique set of attributes of a public organisation climate leader in a regional context. Although the study was conducted in a specific context of the Pirkanmaa region, we would see these results as useful also to other regions. Thus, this research can give tools to regional actors in planning their climate work.

In order to support the planning and implementation of regional climate action, educational support and resources should be provided to regional decision-makers to learn these competencies. Continuous education on climate change, as well as leadership, should be provided in a holistic manner, to touch upon values and motivations (e.g. Cantell et al., 2019). Creating such an education would require collaboration between climate scientists, management

researchers, educators, and regional actors. In the Pirkanmaa region, Pirkanmaa Climate Action Lab was established in 2023 with funding from the Pirkanmaa Regional Council and the European Union. The aim is to enhance regional climate action in collaboration with researchers and other actors in the region. Learning of the climate leadership competencies will be further studied in this context.

This study highlights the importance of 1) educating leaders who can foster climate action in regions, 2) helping leaders to identify their competencies and develop them (as mentioned by one respondent in Stage 3), and 3) discussing and raising climate leadership as a topic and identify differences and similarities to other types of leadership.

Acknowledgements

This research has been funded by the Research Council of Finland grant number 340791. Marianne Santala has also got funding from the Finnish Cultural Foundation under Grant 00200983. Authors want to thank participants of the survey as well as organisers of the Pirkanmaa Climate Leadership Forum for collaboration.

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Kliimapoliitika eestvedamiseks vajalikud pädevused Soome Pirkanmaa maakonna avaliku sektori organisatsioonide näitel

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Kokkuvõte

Piirkondade roll kliimamuutuste leevendamise ja nendega kohanemise meetmete elluviimisel on väga oluline. Pirkanmaa maakond Edela-Soomes (tuntud ka kui Tampere piirkond) koos paljude teiste Soome piirkondadega on seadnud eesmärgiks kliimanetraalsuse saavutamise aastaks 2030 (Hyttinen *et al.*, 2020). Uuringu raames küsisime Soome Pirkanmaa maakonna avaliku sektori organisatsioonides kliimastrateegiate koostamise ja rakendamisega tegelevate töötajate arvamust selle kohta, mida on vaja kliimapoliitika eestvedamiseks piirkondlikus kontekstis. Kirjeldame piirkondliku tasandi avaliku sektori organisatsioonides töötavate kliimamuutuste leevendamise ja nendega kohanemisega tegelevate juhtide ehk kliimapoliitika juhtide omadusi ressursside, protsesside, probleemide ja motivatsiooni kaudu ning piirkondlikul tasandil kliimapoliitika eestvedamiseks vajalikke pädevusi.

Pirkanmaa kliimameetmete juhtimise foorumi algatasid 2020. aastal Helsingi Ülikool, Tampere piirkonna nõukogu, Tampere piiskopkond ja Tampere piirkonna majandusarengu, transpordi ja keskkonna keskus. Esimene foorum pidi toimuma 2021. aasta kevadel Helsingi Ülikooli Hyttiälä metsanduskeskuses Juupajokis, kuid pandemia tõttu korraldati selle asemel kaks veebifoorumit: 2021. aasta jaanuaris veebiseminar ja 2021. aasta juunis veebiüritus, mida kanti virtuaalselt üle Hyttiäläst. Foorumitele olid kutsutud omavalitsusjuhid, keskkonnajuhid, koguduste juhtivad vaimulikud, samuti usaldusisikud, kes töötavad Pirkanmaa maakonnas kliimavaldkonna juhi või eksperdina.

Uuring järgis Delphi uuringu struktuuri (vt Osborne *et al.*, 2003; Brill *et al.*, 2006), mis hõlmas kolme järjestikust uurimisetappi, millest igaüht analüüsiti suunatud sisuanalüüsi (Hsieh & Shannon, 2005) abil. Esimeses etapis saadeti 2021. aasta juunis toimunud Pirkanmaa kliimameetmete juhtimise foorumi veebiüritusel osalejatele küsimustik ja kogutud vastuste põhjal

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koostati sisuanalüüs. Teises etapis arutati 2022. aasta kevadel toimunud töötoast osavõtnutega esimese etapi vastuste põhjal koostatud pädevustabeleid. Kolmandas etapis tutvustati kahes esimeses etapis osalenutele uuringu esialgset analüüsi ja koguti e-posti teel mõtteid, et teha ettepanekuid selle kohta, millised peaksid olema avaliku sektori organisatsioonide kliimapoliitika juhtide tunnused.

Esimesele küsimustikule vastajad esindasid Pirkanmaa maakonna avaliku sektori 11 organisatsiooni. Neis organisatsioonides järgiti riiklike katusorganisatsioonide koostatud kliimakavasid, näiteks süsinikuneutraalsuse saavutamise kava aastaks 2030. Uuritud organisatsioonides rakendati juba mitmeid kliimameetmeid või olid need planeerimisjärgus. Paljudes asutustes juba toimusid lihtsad ja kulutõhusad meetmed, näiteks ringlussevõtt ja energiatõhususe parandamine, samas ei olnud keerulisemad tegevused, nagu isikliku autoga sõitmise minimeerimine või heitkoguste kompenseerimine, isegi planeerimisfaasis. Vastajad kirjeldasid ennast kui ressursside jätkusuutlikke kasutajaid ja kliimameetmete rakendamise vahendajaid oma organisatsioonis. Kliimaeesmärkide elluviimist takistavate asjaoludena oma organisatsioonis nimetati kahte liiki probleeme: need, mis on seotud teiste töötajate ja protsesside juhtimisega, ning need, mis on seotud ressurssidega. Keeruliseks peeti ka nii enese ja teiste motiveerimist kui ka kahtluste hajutamist. Sageli peeti takistuseks uute ressursside hankimist ja jaotamist. Isiklike motivaatoritena kliimameetmete rakendamisel mainisid vastajad planeedi olukorda ja selle päästmise tähtsust, vastutust ja inimese rolli keskkonna kaitsjana ning isiklikku huvi ja võimalust mõjutada. Sealjuures ei olnud pooled vastanutest saanud mitte mingit kliimaharidust.

Uuringus osalenud Pirkanmaa maakonna kliimapoliitika juhid kirjeldasid piirkondliku avaliku sektori organisatsiooni kliimapoliitika juhti kui *asjatundlikku tegutsejat, kes teeb koostööd, motiveerib ja kutsub üles pühenduma; algatab ja viib ellu muutusi, tehes seda juhtides, õppides ja kuulates. Sellised juhid arendavad enda ja oma organisatsioonide kliimaväärtusi, vahendeid, materjale ja ressursse igapäevaseks tegevuseks, otsivad investeringuid ja ressursse kliimameetmete elluviimiseks kohalike, riiklike ja ülemaailmsete strateegiate kaudu.*

Piirkondlikuks kliimapoliitika eestvedamiseks vajalikke pädevusi võib kirjeldada järgmiselt: 1) *teadmised*: asjatundlikkus nii kliimamuutusi puudutavates küsimustes laiemalt kui ka juhtimises ning pidev enesetäiendamine neis valdkondades; 2) *oskused*: koostööoskused ja muutuste juhtimise võime; 3) *hoiakud*: alandlikkus ja kuulamisoskus, kuid ka otsustav tegutsemine ja julged visioonid; 4) *väärtused*: tugev kliimaalane väärtusbaas. Piirkondlikele otsustajatele tuleks pakkuda hariduslikku tuge nimetatud pädevuste omandamiseks, et toetada piirkondlike kliimameetmete kavandamist ja rakendamist.

Kokkuvõttes sisaldab see kirjeldus piirkondlike avaliku sektori organisatsioonide kliimapoliitika juhtidele omaste tunnuste unikaalset kogumit. Kuigi uuringu praktiline kontekst on omane vaid uuritud piirkonnale, leiame, et tulemused on kasulikud ka teistele piirkondadele. Seega on uuringu eesmärk pakkuda piirkondlikele organisatsioonidele abivahendeid, millega planeerida kliimameetmete rakendamiseks tehtavat tööd.

Selle uuringu eesmärk on toetada hariduse kavandamist selliselt, et see vastaks paremini piirkondlike kliimameetmete elluvijate vajadustele. Uuringus 1) rõhutatakse, kui oluline on koolitada juhte, kes saavad edendada piirkondlikku kliimapoliitikat; 2) näidatakse, kuidas aidata juhtidel tuvastada oma pädevusi ja neid arendada (nagu mainis üks vastaja kolmandas etapis) ning arutada ja tõstatada kliimapoliitika eestvedamise teemat ning selgitada välja erinevused ja sarnasused muud tüüpi juhtimisega.

Võtmesõnad: kliimamuutuste haridus, täiendõpe, piirkondliku kliimapoliitika eestvedamine