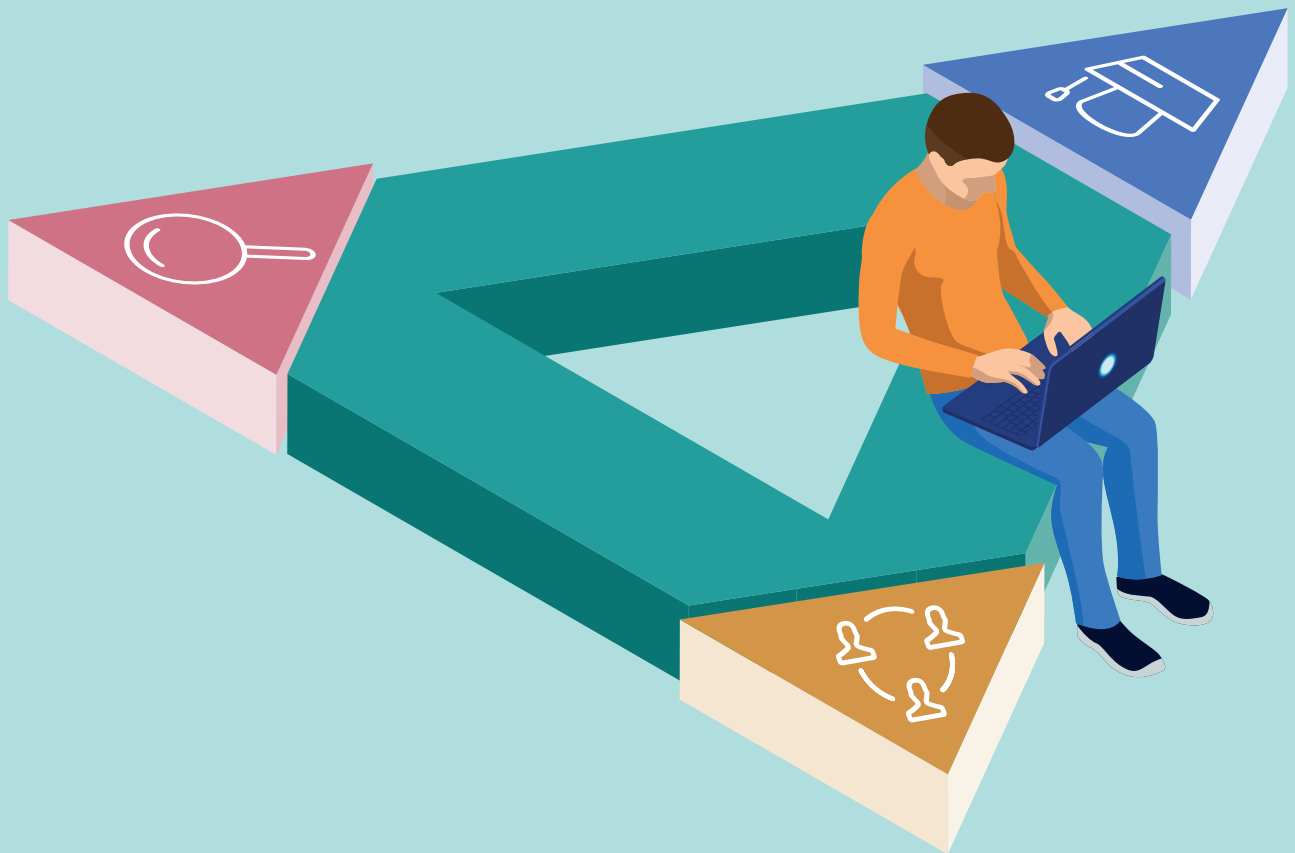


Climate Adaptation Platform

Knowledge Development,
Education and Societal Impact



Colophon

Published by the Wubbo Ockels School for Energy & Climate

Design and graphics:

Anja Robbeson
Hekman Design

Print:

Canon

April 2024

Climate Adaptation Platform

Knowledge Development, Education and Societal Impact

Summary

The purpose of this document is to build on the Vision Document on the Climate Adaptation Platform presented last year. In this document, we specify planned actions in the areas of knowledge development, education and societal impact in the field of climate adaptation with a specific focus on the Northern Netherlands.

In the field of knowledge development, CAP has set up a research agenda for the Northern Netherlands that focuses on four key themes for the region: 1) Promoting urban climate adaptation and resilience, 2) Promoting nature-based water buffers in the vicinity of urban areas, 3) Strengthening nature-based coastal management and agriculture, and 4) Financing and policy-making related to climate adaptation. CAP then developed a roadmap for the next five years to drive more interdisciplinary research projects around the key regional themes and facilitate the formation of larger consortia between researchers, companies and government.

For education, the CAP has put together a research agenda aimed at contributing to the generation of 'human capital' needed to meet the climate adaptation challenges in the Northern Netherlands. Together, we drew up a roadmap for the next five years for integrating climate adaptation into the joint educational programmes of the various higher education institutions in the Northern Netherlands. The programmes focus on the competences needed for a climate-adaptive future and best practices from practice.

Finally, CAP has developed an agenda for societal impact with the ambition to become a testing ground for societal innovation and valorisation in the field of climate adaptation in the Northern Netherlands in five years' time, involving everyone (society, research, education, business and policy) to create societal acceptance of climate adaptation measures for a climate-proof and water-robust region.

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The purpose of this document is to build upon the Vision document presented last year about the Climate Adaptation Platform (CAP; the Vision document is called 'Plan for a CECA 121022v2'). In this document we specify the planned actions as regards Knowledge Development, Education and societal Impact in the field of climate adaptation with a specific focus on the Northern Netherlands.

Over the past year, the CAP core team had regular meetings and interactive workshops and discussed how to concretely advance our collaboration across the domains of Knowledge Development, Education and societal Impact.

For Knowledge Development, CAP identified the key research focus of the stakeholders within the CAP individually, as well as our collective complementarities and synergies. This was combined with our understanding of the key emerging climate adaptation issues in the region to generate an actionable research agenda.

In addition, the CAP core team discussed how CAP could be a catalyst for re-shaping teaching and learning within the climate adaptation field in the Northern Netherlands, which has resulted in a Teaching and Educational Programme.

And finally, the core group discussed how to create societal impact in an accessible way to a wider audience, and presented themselves at a number of public engagement events, including the *Suikerbrij festival* and Let's GRO.



1 Introduction

The global climate is changing – global temperatures are increasing, ice glaciers are melting, the sea level is rising. We have to deal with more extreme weather conditions, long periods of drought, bush fires, periods of water scarcity, or extreme rainfall and flooding. All over the world, climate change has a huge impact on our liveability, our food supply, our economy, our health and our safety.

In the Netherlands we also experience this change in climate. Temperatures are on the rise, resulting in high temperatures in summer and milder winters. Weather conditions are also becoming more extreme, with increased chances of extreme rainfall, heatwaves or periods of drought (see the recent KNMI climate scenarios for the Netherlands www.knmi.nl/klimaatscenarios).

In contrast to measures to reduce the global warming of the earth (climate mitigation), measures of climate adaptation focus on the way we can adapt our societies and ecosystems to long-term climate trends and how we can manage the risk of extreme weather events. Examples of climate adaptation are: the reinforcement of the dikes, the broadening of rivers and the greening of urban areas.

Also transformation is needed to shift systems away from unsustainable and unjust trajectories towards a climate resilient society. Such transformations include environmental, social, economic, demographic and institutional changes. Conditional for such changes are leadership, multi-stakeholder collaboration and the building of human capacities, while avoiding the risk of deepening social injustice and inequalities on multiple scales.

1.1 Upcoming challenges in Northern Netherlands

As part of the Dutch delta, the Northern Netherlands is prone to a wide range of climate change effects. In the North, climate challenges converge in a concentrated way in different types of landscapes within only a few kilometres. Each of these different landscapes pose different challenges in terms of adaptation.¹

In the Wadden Sea-area climate change and the rising sea level may lead to flooding and coastal erosion, which potentially forms a severe threat for the safety of the inhabitants. Besides, also the structure, functions and biodiversity of the Wadden Sea-area will possibly change for the coming years. A bit further from the coastline, challenges such as salinization, drought and the loss of biodiversity are present, which makes the area less useful for agriculture. Agricultural practices in

turn need to urgently take into account the implications for biodiversity. Further inland the wetlands and higher sandgrounds alternate. Due to reduced rainfall and increased evaporation during summer, parts of this area are threatening to dry out during the summer. Lack of drinking water, subsidence of the peat soils and emission of CO₂ are already taking place.

Finally, the historically compact cities in the Northern Netherlands will have to deal with an increasing number of extreme weather events such as heat, drought and floods. This has costly impacts on cities' basic services, infrastructure, housing, human livelihoods and health. In the coming years even more people will be affected by this, due to increasing migration to the Dutch cities.

These upcoming climate challenges, combined with various socio-economic challenges and a fast-growing city/cities, makes the Northern Netherlands eager to act. We will have to adapt to the effects of climate change, and we should do it fast and together. In the Northern Netherlands it is envisaged that public authorities, universities, research institutes, schools, social institutions and the business community will therefore work together intensively on climate adaptation with the potential for sharing lessons learned across other contexts globally. Thanks to these institutions and networks and a large number of innovative companies and start-ups, together with a young, highly educated population, the Northern Netherlands is well equipped to carry out research, education, experiments and initiate living labs – both in the city and its surroundings, to deal with these challenges. The CAP initiative is designed to further stimulate this ecosystem.

¹ A source of inspiration for this is the [Sponsland](#) initiative. This design manifestation focussed on different types of Northern landscapes (from the sand in Drenthe to the Wadden island of Schiermonnikoog), each of them dealing with different challenges in relation to climate adaptation.

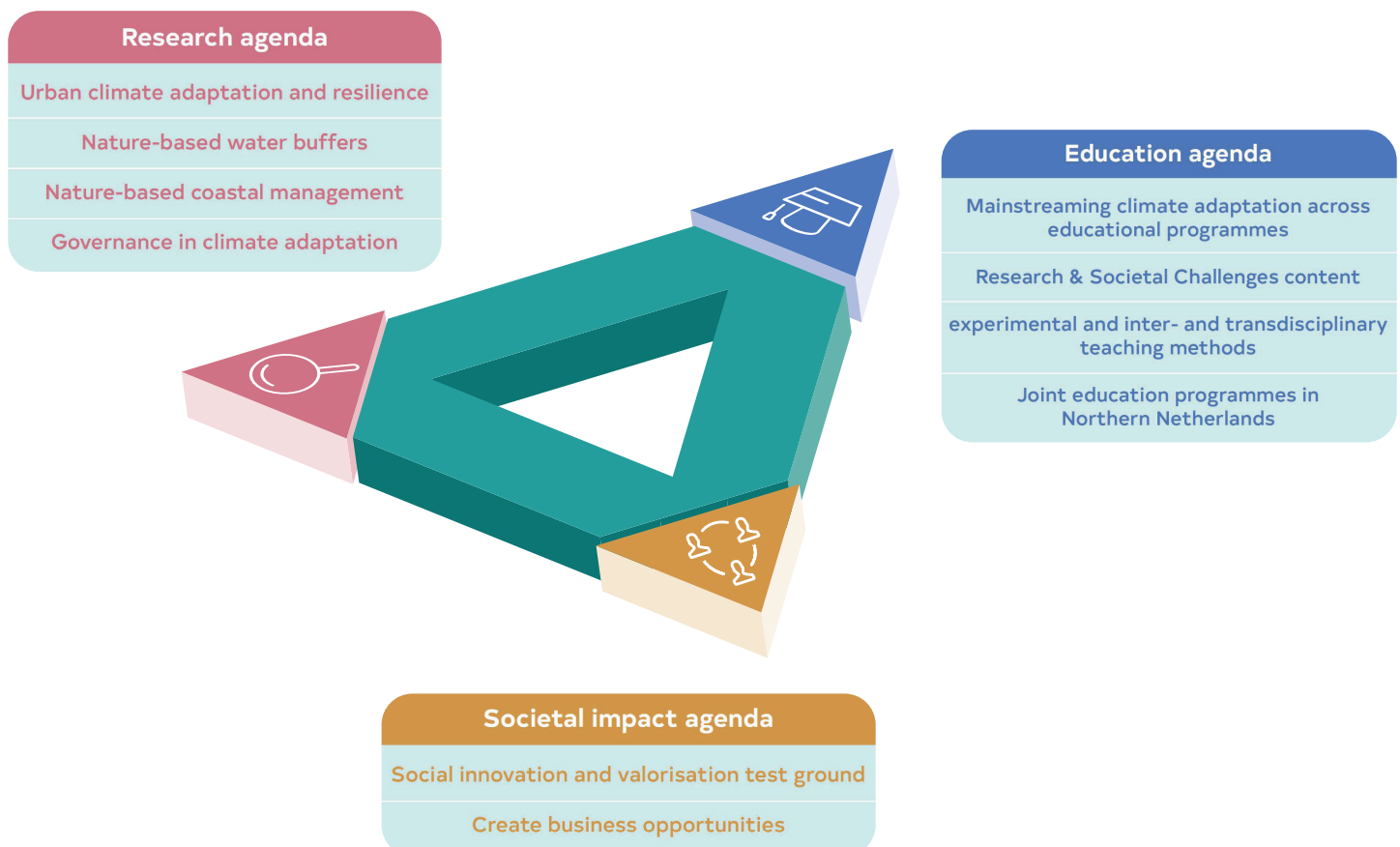
2 Setting the vision, mission, goals and guiding principles of CAP

CAP's **vision** is to contribute to Northern Netherlands' ambition to be a national and global pioneer for climate action, with a specialised focus on climate adaptation. The IPCC defines climate adaptation in human systems as:

“the process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate this.”

Next to human systems is of course pivotal to focus on natural systems. The **mission** of the CAP is to contribute to the achievement of the 2025 and 2050 Climate Adaptation Goals by **providing a platform for creating and maintaining stable and productive collaborations among all parties involved in climate adaptation in the Northern Netherlands**: knowledge institutions, general public, businesses, local and regional government (quadruple helix approach).

More generally, CAP will contribute to the improvement of the Northern Netherlands socio-economic ecosystem in the field of climate adaptation, thus contributing to the establishment of new initiatives in this field. The CAP has three pillars, the first two focus on research and education, and the last deals with societal impact and the 'valorisation' of knowledge. The goals and agenda for the three pillars are detailed below in separate chapters. However, CAP aims to develop the three pillars in synergy with each other as much as possible.



3 Knowledge development

Climate adaptation is not only a technological challenge, but is simultaneously an ecological, social-cultural and political challenge as well. The key strengths of the CAP research programme include the adoption of interdisciplinary and transdisciplinary approaches in fundamental, applied and policy learning-oriented research. In addition to engineering and ecological perspectives, perspectives from the social and spatial sciences will be explicitly integrated to allow adaptation solutions to be inclusive, bankable, socially

just, acceptable and attractive – enhancing local and regional spatial qualities. These interdisciplinary and transdisciplinary aspects represent an added value of Northern Netherlands research in the international climate adaptation debate. More specifically, a research agenda for the CAP was developed accounting for four core CAP principles: an area-based approach; a quadruple helix approach; interdisciplinarity; and local-global linkages. These principles and their translation to research engagement are further explained in Table 1.

Table 1: CAP's principles and their translation to its research engagement

CAP principle	Translation to research engagement
Area-based approach	Research will be area-based and focus on the Northern Netherlands and specific areas (regions, cities) within NN at different scales. Encompassing the three provinces of Drenthe, Friesland and Groningen, the region features considerable commonalities in terms of exposure to climate risks relating to sea level rise, soil salinisation, constraints on water overflow storage as well as heat stress in the historically compact urban areas.
Quadruple helix approach	CAP adopts a quadruple helix approach eliciting the engagement of public bodies (inter alia provinces, municipalities and water boards), the private sector as well broader civil society together with researchers in: <ul style="list-style-type: none"> • identifying gaps in knowledge • setting the research agenda • directly implementing the recommendations arising; • disseminating the results more broadly. For example, we are advancing engagement with relevant stakeholders in relation to aligning research with the implementation of the National Programma Landelijk Gebied and the Uitvoeringsagenda of the relevant climate adaptation strategies in the Northern Netherlands.
Interdisciplinarity & transdisciplinarity	The research is interdisciplinary, drawing on research expertise in inter alia spatial planning, ecology, governance, water management, as well as applied community-based and psychological approaches. This is an essential feature of the area-based approach given the breadth and complexity of climate risks in any given region across scales from the landscape level through to the community, household and individual levels. On the basis of intense interdisciplinary research collaboration within the region (transdisciplinary collaborations thus) a more comprehensive overview of the interactions and trade-offs between different domains that are traditionally considered separately from a research perspective will be achieved.
Local-global linkages	We will promote local-global connections within our research engagement. While the Northern Netherlands will be at the centre of our focus, we will nonetheless remain attentive to the links across other regions within the Netherlands, the EU and globally. There is particular potential for the CAP to facilitate knowledge transfer to and from other low-lying and delta regions. Research concerning the northern Netherlands will be informed by the global state-of-the-art research and will in turn inform best practice. This objective will be facilitated not least by the inclusion of the Global Center on Adaptation within our platform.

Over the last few months, following a process of concertation, CAP highlighted research themes with a high capability of fostering innovation, practical solutions and knowledge development and dissemination in the field of climate adaptation in the Northern Netherlands. The CAP's research can thereby provide decision support to policy-makers and other stakeholders through the analysis of implementation and its key enablers, including support by public, business and civil society as well as financing and expertise. To this extent, the CAP research agenda is also aligned to fit within the context

of the implementation of a range of climate adaptation strategies at different spatial scales and by different organisations, most notably the Regional Adaptation Strategy Groningen Noord-Drenthe (RAS), de Friese Klimaatadaptatiestrategie and the National Programma Landelijk Gebied and related strategies across the region. Finally, in designing and prioritising the main themes for the research agenda, the different landscape types and geographical contexts that we find in Northern Netherlands have been taken into account.

The result is a research agenda for the Northern Netherlands that focuses on four themes, namely:

1. Promoting urban climate adaptation and resilience
2. Promoting nature-based water buffers in proximity to urban areas
3. Enhancing nature-based coastal management and agriculture
4. Financing, legislation and policy-making with respect to climate adaptation as such, and overarching theme, which is also relevant for the three themes mentioned above

3.1 Promoting climate adaptation and resilience in urban settings

The North of the Netherlands is marked by historically compact urban spaces. The city of Groningen is a classic example of that. Groningen is a growing city that holds a central position in the province with a high number of inhabitants, a good quality of life, and a good network structure. These conditions are crucial for the functioning of such a city. Yet, the compact concrete environment with little space for greenery has high risk of flooding and heat stress. To improve the urban environment and to be able to adapt to the changing climate, the urban environment needs to be restructured and resilient and water-sensitive communities need to be developed. Urban climate resilience benefits greatly from design-based planning, such as the Water as Leverage programme. This programme promotes sustainable economic development of urban areas by using water management challenges as an opportunity for project development.

The RAS *uitvoeringsagenda*² envisions a number of projects for the city of Groningen to become a green, resilient city by 1) promoting green-blue structures in the city, 2) enhancing the so-called sponge effect or water absorbing capacity in the built environment, and 3) creating a network of public green spaces, watercourses and surface water. Urban climate adaptation is not only about physical-spatial measures and their effectiveness, research on the development of resilient and water sensitive communities, and the governance arrangements required for this needs to be included as well.

Within this theme the following six initial areas of investigation have been defined:

- What is the effectiveness of experimental urban design projects in terms of the reduction of heat stress and flooding risk and what are the recommendations for future projects?
- How can design-led planning and co-creation with citizens become the new normal and how can co-creation continue, even after the pilot phase? What changes (transition) in government culture and organisation are necessary to enable resident participation and how can administrators deal with the responsibility for budget and policy when they hand over control?
- What is the impact, if any, the new urban green-blue projects will have on biodiversity? And what approaches in terms of implementation enhance biodiversity the quickest?
- What is the impact of newly implemented urban green-blue spaces on public health/healthy ageing? By tracing health indicators in advance of the implementation of the projects and afterwards, we can obtain an insight into the impact of such projects over time.
- How to stimulate and enable the development of inclusive water sensitive and climate resilient urban communities?
- What are institutional barriers and opportunities and which climate adaptation governance arrangements (CAGAs) are required for increasing urban climate resilience in the North of the Netherlands?

3.2 Promoting nature-based water buffers in proximity to urban areas

As noted in the Regional Adaptation Strategy Groningen-North Drenthe, natural water systems such as streams along the Hondsrug and the Maren in the province of Groningen have been affected by various land uses with negative effects for water storage, flood risk reduction and biodiversity. We need to change the way we use the land and allow for the storage and distribution of water in a manner that has the potential to increase the resilience and robustness of the wider water system on one hand, and ensures the continued availability and quality of drinking water in the region. Hereby, we can build upon the ongoing experiences in the Hunze and the Drentse Aa, and incorporate these best practices in other regions in Northern Netherlands. Large-scale increases in water storage requires significant land-use change and other land uses are often given priority due to perceived higher economic value. This in turn demands careful engagement with land-owners and other stakeholders in the affected region in order to achieve the desired outcomes. Significant governance and behavioural change challenges arise in order to realise the ambition of large-scale re-wetting.

² Both the Province and Gemeente Groningen are members of the Werkregio Groningen and North Drenthe and are represented in the CAP core group.

Within this theme the following four initial areas of investigation have been defined:

- How to organise stakeholder engagement in relation to significant land-use changes?
- Are there alternative farming practices in which farmers can make a living?
- How to optimally incentivise land use changes and design governance arrangements required in order to develop and implement nature-based water buffers?
- Enhancing water storage will lead to reduced/increased peat oxidation and increased biodiversity. What will be the impacts on emissions reduction and nature enhancement over time?
- How does increased biodiversity and the enhancement of green and blue spaces link to public health/healthy ageing? The enhancement of the quality and quantity of water may be a key enabler in this regard.

3.3 Enhancing nature-based coastal management and agriculture

The Wadden coast has been identified as a key area requiring the synthesis of climate adaptation research. Coastal areas in the Northern Netherlands are increasingly being threatened by sea-level rise and salination with implications for both coastal protection and agriculture. Given that 80% of the land area of the province of Groningen is used for agriculture, one of the core features of the RAS is to stimulate climate adaptive agriculture that at the same time is regenerative and sustainable. The RAS also foresees the use of nature reserves in outlying areas to act as climate buffers, in combination with climate-proof design and management measures.

Within this theme the following two initial areas of investigation have been defined:

- What nature-based solutions can be used for protecting our land from sea-level rise? i.e. How can salt marshes in the Wadden Sea area be adapted to sea level rise?
- How to enhance regenerative and adaptive agriculture and food systems in the coastal area?
- Which strategies and governance arrangements are required for coastal management?

3.4 Financing, legislation and policy-making with respect to climate adaptation

In addition to the previous research topics that are related to different landscape contexts, our research agenda also addresses strategies and policy making with respect to climate adaptation. Included in this are aspects such as the changing roles and responsibilities of actors including the local and regional governmental

authorities involved, and issues of sustaining production and consumption. A key enabler of climate adaptation is the sharing of knowledge concerning climate risk and adaptation strategies with and amongst key stakeholders such as residents and business owners. As many policy and implementation plans are already well on their way, there is already a body of knowledge and experience available. What is currently missing is an independent critical assessment of national and regional plans and patterns of implementation in pursuit of explanations for why particular measures are taken in some locations and not in others. In addition, there is a knowledge gap concerning financing and financial feasibility. This theme coheres well with the Regional Adaptation Strategy Groningen and North Drenthe in which successful governance arrangements as well as increased risk awareness are considered key enablers.

The following initial areas of investigation have been defined:

- How are, can and should adaptation interventions be justified from a financial perspective by public, private and other bodies in Northern Netherlands to account for broader societal and environmental benefits? How can such financing be practically secured?
- How are national and regional plans and implementation currently performing? Why are particular measures taken in some locations and not in others? What lessons can we learn from critically assessing current policy practice for future planning and implementation?
- How can knowledge concerning climate risk and adaptation strategies with and amongst stakeholders such as residents and business owners better be shared?
- How to share knowledge between the various stakeholders involved?

The CAP will continue to engage with the relevant stakeholders for each of these research themes in relation to the following: what do we know, what do we not know, what are best practices and where are there still challenges in the way. The CAP will pursue three types of research: (a) applied and practice or user-oriented research; (b) fundamental research; and (c) policy and learning-oriented research. Moreover, research engagement will be animated by following the four core principles of the platform.

3.5 Time-line for setting up the research program on Climate Adaptation

In the short term (2024-2025)

CAP will:

1. Organise a series of research seminars with scientific staff of the different HEI's, research institutes and with relevant stakeholders around the above research topics to 1) familiarise researchers with one another and to create synergies between the different disciplinary perspectives, and 2) to stimulate collaboration between individual researchers and the formation of consortia between researchers, businesses and government,
2. Continue mapping the relevant stakeholders in the Northern Netherlands. Currently, a trainee at the UG is mapping the network on water (water management, coastal management, flood risk, ..) in Northern Netherlands,
3. Where possible, newly recruited research staff and students will be brought together under the CAP umbrella, thereby fostering an adaptation research community that is aligned with the CAP's knowledge development agenda,
4. Continue mapping and creating funding opportunities for the research agenda, and promoting these opportunities via website, newsletter and social media of the CAP, and connected partner organisations,
5. Stimulate interdisciplinary PhD projects between researchers of different faculties (for instance the M20 positions; in 2023 a M20 PhD project is granted on Climate Advocacy, a collaboration between researchers from the Faculty of Spatial Sciences and the Faculty of Behavioural and Social Sciences), and PhD positions between researchers of UG and Universities of Applied Sciences in Northern

Netherlands (Hanze University of Applied Sciences, NHL Stenden, Van Hall Larenstein),

6. Stimulate research master projects between research-oriented institutions and relevant stakeholders represented in the CAP, including business, municipalities, provinces and water boards.

In the midterm (2026-2027)

CAP will:

1. Organise regular meetings with scientific staff of the different HEI's, research institutes and relevant stakeholders around the specific research topics, and larger conferences,
2. Organise regular meetings between relevant stakeholders and researchers for collaboration on demand-driven topics,
3. Promote the formation of interdisciplinary projects on climate adaptation with PhD and Postdocs, working on questions from relevant stakeholders.

In the long term (2028 - and beyond)

CAP will promote and facilitate the formation of larger consortia (Interreg, ..) between researchers, businesses and government that will work together on interdisciplinary research projects tackling important regional topics.

3.6 Research funding opportunities

In order to finance the presented research agenda, CAP is seeking a number of funding schemes to enable investigation of the different research topics. Hereby, CAP is not only focussing on the regular funding mechanisms of the Universities, but also on additional money streams via businesses and non-profit organisations.

Time-line for setting up the research programme on Climate Adaptation

Research seminars with scientific staff of the different HEI's, research institutes and relevant stakeholders

Bring together newly recruited research staff and students under the CAP umbrella

Mapping relevant stakeholders in the Northern Netherlands

Mapping and creating funding opportunities for the research agenda, and promoting these opportunities

Stimulate interdisciplinary PhD projects between researchers of different faculties

Stimulate research master projects between research-oriented institutions and relevant stakeholders

2024

2025

2026

2027

Regular meetings with scientific staff of the different HEI's, research institutes and relevant stakeholders

Regular meetings between relevant stakeholders and researchers for collaboration on demand-driven topics

Promote the formation of interdisciplinary projects on climate adaptation with PhD and Postdocs

Promote and facilitate the formation of larger consortia between researchers, businesses and government that will work together on interdisciplinary research projects tackling important regional topics

2028



4 Education

The Climate Adaptation Platform (CAP) has as its aim to contribute to the generation of human capacities necessary to cope with climate adaptation challenges in Northern Netherlands.

To promote accelerated climate adaptation within the Northern Netherlands the CAP will function as a catalyst for re-shaping teaching and learning within the climate adaptation field in the Northern Netherlands in terms of content, methods and broader programming, and collaboration between knowledge institutions. CAP will develop a Teaching & Educational Programme, building upon and making strategic use of the educational programs that already exist at the level of participating **Higher Education Institutions** (HEIs, including MBO-HBO-WO), and where appropriate, helping developing new educational content in concertation with business and societal needs.

CAP's Training and Educational Programme will be based on the following key principles:

- **Mainstreaming climate adaptation across educational programmes:**
The CAP will contribute to the mainstreaming of climate adaptation within all relevant programmes across the HEIs.
- **Research & Societal Challenge led content:**
The CAP research themes and priorities for the Northern Netherlands will form the basis for the development of the content to be delivered. Civil Society Organizations will provide challenges on these themes to be solved by teams of students from the participating HEIs
- **Experiential and inter-/trans-disciplinary teaching methods:**
The CAP will contribute in developing challenge-based education activities, courses, and programmes, thereby fostering students' direct engagement with ongoing and future adaptation-related challenges within the region and with relevant stakeholders.
- **Joint education programmes between HEIs in Northern Netherlands:**
The CAP contribution to the education programmes ensures that students from HEIs will learn to work together to contribute to climate adaptation.

4.1 Educational objectives of CAP

1. Community building: Support sharing of best practice among teaching and learning staff concerning the climate adaptation dimension of their teaching, with the aim 1) to mainstream the climate

adaptation dimension into a range of programmes across HEIs, including professional and/or business school kind of education, and 2) to ensure attention to the climate adaptation as well as the more established climate mitigation dimensions within programmes.

Proposed activities:

- Organise 'Meet & greets' between educational staff from the participating HEIs to get to know each other and exchange experiences, and follow-up meetings around certain topics or shared challenges to promote promising collaborations. Central question here is what do they need from the CAP to cash in these collaborations?
- Promote ad-hoc reciprocal guest lectures across programmes
- Share syllabi and teaching and learning methods relating to climate adaptation
- A 'library' with collection of innovative education projects of the different HEI's
- A regular climate action newsletter will be made available to instructors of programmes of relevance to climate action. By engaging across all aspects of climate action, recipients engaging primarily on climate mitigation can also be sensitised to the importance of climate adaptation. The newsletter can showcase successful integration of climate adaptation into relevant programmes across HEIs, e.g. art and design students working on communicating risk and successful transformations towards climate resilience.

2. Create synergies in relation to delivery of existing & new educational programmes, to address unwarranted overlap and enhance the quality of programmes.

Proposed activities:

- Conduct a mapping exercise of the programmes of relevance to climate adaptation across the participating HEIs
- Develop new educational programmes with the aim to develop a joint program between the different HEI's. The idea is to set up a Minor on Climate Adaptation with the focus on ecology and biodiversity, with the aim of making students aware of the need to conservative (and restore) biodiversity and ecosystems, and to perform research on nature resilience and species adaptation, and to discuss how to translate this knowledge into innovative management.
- Guarantee complementarity between a) existing programmes and b) existing and new programmes
- Organise meetings between HEI's and policy makers and businesses to become aware of the skills that are needed in the coming years for the different professional groups
- Develop Post Academic Course on Climate Adaptation with input from the different HEI's, and with good practices from regional projects such as de Onlanden, "Dubbele dijk", "Blauwestad" and Meerstad

3. Promote challenge-based learning relating to climate adaptation, with the aim to provide a learning environment where students can engage directly with climate risk in the Northern Netherlands cooperating with all HEIs in our region. This could potentially involve groups composed of students from HEIs from across the knowledge column and from different disciplinary backgrounds. In this way a range of disciplines could be triggered to incorporate climate adaptation into their curricula. Location-based and innovation challenges will be identified by key relevant stakeholders.

Proposed activities:

- Obtain location-based and innovative issues from relevant stakeholders in the region for instance for internship assignments, research master projects and the organisation of hackathons. Examples of a number of challenges that municipalities in the Province of Groningen deal with are: exotic invasive species, public awareness campaign on climate adaptation, and what-if scenarios in the northern safety region

- Adapt existing living lab arrangements within programmes (e.g. those at HUAS/UG-FSS/UG-CF) for deployment within the climate adaptation field. These can then be showcased to inspire similar engagement across other programmes. The Province of Groningen, Alfa College, Terra, Noorderpoort and Hanze University of Applied Sciences initiated a number of meetings to discuss how to further develop this.
- Organise climate adaptation-related competition/hackathons for student groups from the different HEI's

4. Promote greater collaboration between students from different disciplines and HEIs, thereby addressing the current siloing of students working on climate adaptation-related topics within HEIs and into faculties/departments within HEIs.

Proposed activities:

- Set up a network that organises activities (like workshops, lectures, debates, ...) on common themes linked with the CAP agenda that are attractive for students of the different HEI's. A good example is the weekly online Climate Cafe by Floris Boogaard, professor at Hanze University of Applied Sciences. Another initiative is the network for and by youth on Climate Adaptation, organised by the Province of Groningen, Alfa College, Terra, Noorderpoort and Hanze University of Applied Sciences. The aim of this network is to actively involve young people on Climate Adaptation.
- Climate adaptation-related competition/hackathon for students (see above).

5. Share climate adaptation expertise relating to N-NL globally as appropriate to enhances research dissemination/valorisation and demonstrates the particular comparative advantages of N-NL within the climate adaptation field.

Proposed activities:

- Building on the successful Massive Open Online Courses (MOOCs) in Climate Adaptation Governance and Urban Climate Adaptation (developed by GCA, UG and HUAS), there is potential to establish additional MOOCs related to the CAP's research themes in cooperation with relevant partner universities and organisations.
- Annual summer or winter schools in collaboration with GCA. A proposal has been received to offer scholarships to students from the Global South.

4.2 Time-line for setting up the Educational Program on Climate Adaptation

CAP will start with low hanging fruit and then move towards a more long-term strategy.

In the short term (2024-2025)

CAP will:

1. Organise a number of meet and greets with educational staff of the different HEI's and with relevant stakeholders, with the aim to 1) exchange knowledge and experience, 2) formulate a logical line with the important topics on CA that need to be addressed in education on CA. What do students need to know in relation to CA? What elements are needed in the educational programme?, and 3) learn about the real-time challenges from relevant stakeholders,
2. Continue with the mapping exercise on existing educational programmes on climate adaptation of the different HEI's, and discuss with lecturers possibilities to 1) include the topic of climate adaptation in the existing program, also in courses where you do not expect it, such as economics and health, 2) organise guest lectures by lecturers from different disciplines and different HEI's and by relevant stakeholders, and 3) open up the course for students from different studies. Examples are: the living lab given by the Faculty of Spatial Sciences/UG, the post academic course on Climate change organised by HanzePro.
3. Experiment with extra-curricular educational projects with challenge-based learning such as hackathons and summer/winter schools. The idea is to work together on a summer school to develop a logical line (see point 1) and test developed materials in a smaller setting. The materials and lessons learned will be used in developing a minor on climate adaptation.
4. Promote the educational programmes on climate adaptation of the HEI's to increase their visibility.

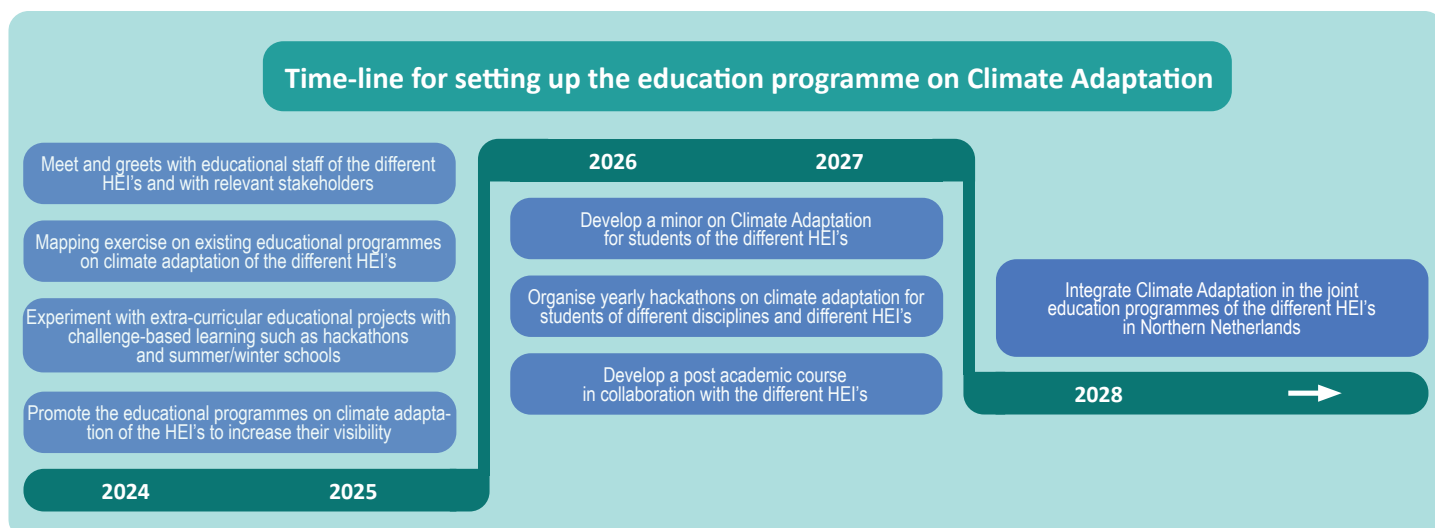
In the midterm (2026-2027)

CAP will:

1. develop a minor on Climate Adaptation for students of the different HEI's, with interdisciplinary character and using real-life challenges relevant for Northern Netherlands,
2. organise yearly hackathons on climate adaptation for students of different disciplines and different HEI's, with real-life challenges from relevant stakeholders in Northern Netherlands,
3. develop a post academic course in collaboration with the different HEI's, building on the experience of HanzePro and tailored to the needs of the relevant stakeholders.

In the long term (2028 - and beyond)

CAP will Integrate Climate Adaptation in the joint education programmes of the different HEI's in Northern Netherlands, thereby incorporating competences for adaptive futures and good examples.



5 Societal impact

Climate adaptation requires radical system change, viewed from a societal perspective. Everything and everyone is needed, is affected by it and needs to move differently. It requires technical, economic and social innovations. From policy, theory and daily practice, from left to right, bottom-up and top-down. Integral, cross-sectoral and public-private partnerships are therefore essential for the sustainable development and implementation of new value chains, technologies, business models and system innovations.

For that reason, the CAP focuses not only on technological and economic innovation (usually described as Technology Readiness, TRL), but also on social innovation and valorisation (also described as Societal Readiness (SRL)). Think of increasing public awareness of the problem, securing 'resources' such as a network or meeting place to continue or drive collaboration, or harnessing the power of a collective voice to influence policy and guidelines.

5.1 A testing ground for social innovation and valorisation

Literally, valorisation means: 'making something valuable'. It is precisely by putting it into practice among people that knowledge becomes valuable. This can be done in various ways: testing knowledge in practice to cash in on it; making knowledge and techniques accessible to wider society; converting knowledge into commercially viable products or services; bringing together and developing knowledge from different sectors and regions; offering students and researchers

business opportunities to further develop their knowledge in practice; but also, for example, by directly including knowledge in policy formulation.

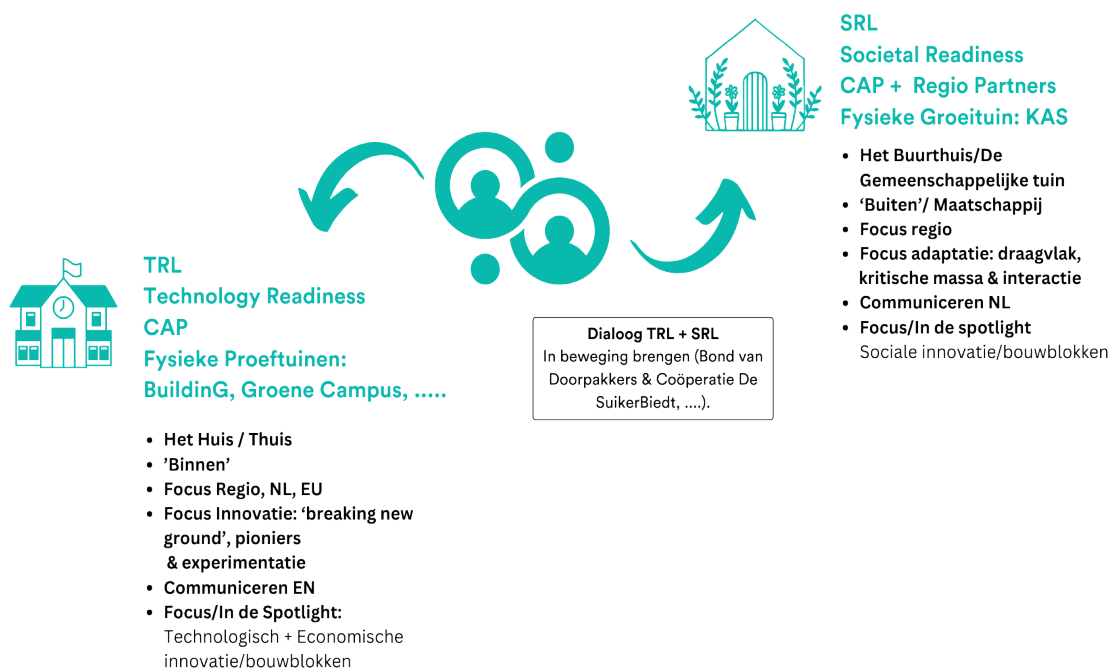
The partners of CAP already have a solid foundation for the necessary technological and economic innovations (TRL) with the existing BuildinG, Green Campus and the Living Labs at University of Groningen, among others, as testing grounds. In these places, knowledge and practice come together, mainly on technological and economic issues. In addition to the current ecosystem, CAP also aims to develop a social innovation and valorisation test ground.

Here we explicitly work on the link with the wider public by:

1. Involving stakeholders and the general public (e.g. by joint meetings, public documentation and deployment of various communication channels);
2. Stimulating social acceptance of climate adaptation measures;
3. Creating business opportunities to commercialise knowledge and techniques

The mechanism or approach we aim to use for this is by several pop-up locations that can help to shape, drive, showcase and make (new) connections in an accessible way for a wider audience. In doing so, we develop a hybrid ecosystem in which a physical (and virtual) location, helps to increase impact with the partners of CAP and other existing collectives like business associations, cooperatives such as Cooperatie de SuikerBiedt, the Bond van Doorpakkers, etc (see figure 1).

Figure 1: graphic representation of the proposed link between Technical Readiness and Societal Readiness



These (temporary) physical pop-up locations can help as a means to practically advance significant aspects of the research and education agenda. In relation to the research agenda, it will provide a testbed for engagement with different stakeholders for the co-production of knowledge, collection and analysis of data, as well as the effective dissemination of results to end users. In terms of the education agenda it also provides the opportunity for knowledge-sharing with a wider set of actors beyond those in formal education as well as for engaging students in formal programmes directly with key stakeholders in climate adaptation.

This approach makes climate adaptation accessible to everyone (read: government, business, knowledge and society), also to the average person with a (dis-) interest in climate adaptation, by pushing this theme, showcasing it and mainly making (new) connections. The mainstream working language is Dutch, the location is movable. The pop-up location of CAP can move around the city, and can for example be present at festivals such as Noorderzon, Suikerbrij festival, Let's GRO; at knowledge and research institutes such as BuildinG, the House of Connections of UG; at community centres and at Forum Groningen, the living room of the city of Groningen. In this way, we move from theory to practice, and from knowledge institutes to society.

CAP will strive to be the place to go for laypersons for enhancing their knowledge about climate adaptation and desire to undertake concrete actions, and to be the place to go for cooperation in the implementation of the Regional Adaptation Strategies. The ultimate aim of CAP is to help build climate resilient communities.

5.2 Time-line for setting up the Societal Innovation and Valorisation Agenda Programme

In the short term (2024-2025)

CAP will:

- deploy various communication channels to promote their activities. For this, CAP will further revive one of the currently dormant websites - <https://klimaatadaptatiegroningen.nl/> or <https://climateinitiativenoordnederland.nl>,
- organise a number of “meets and greets” between stakeholders and knowledge institutes to create opportunities for developing businesses and for commercialising knowledge and techniques,
- experiment with different pop-up activities (i.e. citizen science projects, Living LABs (demand driven approach)) and dialogue sessions at different locations in the city and at local festivals to create meetings with the general public, with the aim to stimulate climate adaptive practices at the individual and household level as well as to support engagement with and social acceptance of broader climate adaptation measures at different scales within the region.

In the midterm (2026-2027)

CAP will:

- Develop a year round programme with different pop-up activities on climate adaptation in the Northern Netherlands to stimulate climate adaptive practices at the individual and household level as well as to support engagement with and social acceptance of broader climate adaptation measures at different scales within the region.
- Organise regular ‘dialogue sessions’ with HEIs, stakeholders, business associations - cooperatives such as Cooperatie de SuikerBiedt, the Bond van Doorpakkers -, policy makers and the general public to promote locally-led innovations that enhance climate adaptation.

In the long term (2028 - and beyond)

CAP will be the societal innovation and valorisation test ground on climate adaptation in Northern Netherlands.



6 A blueprint for change

This social innovation approach with the stakeholders of CAP - and being closely linked to the research and education agenda - is not an isolated initiative; it is an integrated and cross-sectoral approach linked to other transitions such as the energy transition. It may teach us how to approach complex social problems through collaboration, innovation and action and how society can tackle tasks in a rapidly changing world.

It may also be a demonstration of how Groningen is systematically working on transitions and building a future-proof infrastructure from social, political, cultural, technological and economic components, stimulating collaboration and sustainably strengthening the ecosystem.

In this mission-driven innovation system, we work from the regional challenges set out in, among others, the Regional Adaptation Strategy and the Regional Implementation Agenda towards the goal; a climate-resistant and water-robust region.



7 Management Structure (Governance)

CAP is an agile network organisation, with a core staff aiming at fostering collaboration among CAP's parties and coordinating the development of joint research, education and valorization actions. Accordingly, CAP does not have its own legal personality. It will be a facilitator for meetings and connections.

The main bodies of CAP are a Steering Committee and a Core Group (see figure 2). The Steering Committee (Stuurgroep) is composed by the Chairperson on a full time basis (or two part-times chairpersons if this appears more suitable), plus a core representative from UG and HANZE, with an open invitation to the other parties to join if desired, and meets weekly. The Core Group is composed by at least one representative from each partaking organisation and includes a knowledge and innovation broker who is the liaison between the knowledge institutes and the stakeholders, in particular

the small and middle enterprises. The Core Group meets monthly. The Core Group decides on the actions of the CAP on proposals of the Steering Committee and implements the action agreed upon with the support of the relevant CAP parties and external partners. The Steering Group reports regularly to the Directie Overleg (DO) Klimaatadaptatie (at least twice a year). Any fundamental change to the CAP structure of the mission needs approval from the DO Klimaatadaptatie. In case the DO Klimaatadaptatie or Akkoord van Groningen deems appropriate, the Steering Committee in the person of the Chairman will report to the Akkoord van Groningen (AVG).

The Wubbo Ockels School of UG will provide support to the Steering Committee and Core Group by offering coordination support and a stable location for the meetings in the form of the House of Connections.

Figure 2: graphic representation of CAP governance structure



