TRANSFORM

LIVING LABS SUPPORTING THE TRANSFORMATION OF THE DANISH LANDSCAPES

NOVO NORDISK FOUNDATION FINAL APPLICATION

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The project has been formulated by the TRANSFORM consortium in collaboration with the Novo Nordisk Foundation and 15. Juni Foundation. The TRANSFORM consortium represents human, social and natural science departments from four universities, involves an agricultural innovation centre, private companies, state and municipal authorities, along with business associations

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CONTENT

1 EXECUTIVE SUMMARY 5

2 BACKGROUND, RELEVANCE AND GAPS 7
3 VISION, MISSION AND OBJECTIVES 11
4 SCIENTIFIC APPROACH AND KEY ACTIVITIES / WORK PACKAGES 13

4.1 WP0: PROJECT GOVERNANCE 21
4.2 WP1: IT-TOOLS FOR LAND TRANSFORMATION 24
4.3 WP2: SPATIAL LAND USE ASSESSMENTS 28
4.4 WP3: LEGAL FRAMEWORK, LAND OWNERSHIP MODELS AND LAND USE HISTORIES 32
4.5 WP4: COLLABORATIVE PLANNING AND GOVERNANCE 35
4.6 WP5: FUTURE FARMS 40
4.7 WP6: EVALUATION OF POLICY INSTRUMENTS 43
4.8 WP7: OUTREACH AND SYNTHESIS 47

5 TIMELINE AND MILESTONES 50
6 GOVERNANCE AND ORGANIZATION 54
7 PARTNERS AND STAKEHOLDERS 61
8 POTENTIAL AND EXPECTED IMPACT 68
9 SUCCESS CRITERIA AND KEY PERFORMANCE INDICATORS 72
10 DETAILED BUDGET 74
11 RISK ASSESMENT 75

12 REFERENCES 77

LIST OF APPENDICES

a. Excel budget file
b. Excel timeline and milestones
c. Risk assessment and management plan
d. CVs
e. Letters of Commitment
f. TargetEcon model description

LIST OF ABBREVIATIONS

CAP – Common Agricultural Policy
CD – Co-directors
CMS – Content Management System
CSF – Centre for Sustainable Futures
DCE – Danish Center of the Environment
DEP – Danish Environmental Portal *Danish: Danmarks Miljøportal*
DI – Danish Industry
EEIV – Essential Environmental Impact Variables
GHG – Green House Gases
GTA – Green Tripartite Agreement *Danish: Den Grønne Trepart*
IC – Impact Committee
IDA – Union of Engineers in Denmark *Danish: Ingeniørforeningen i Danmark*
IPBES – The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
KTC – Union of Municipal Technical Heads *Danish: Kommunalteknisk Chefforening*
LGT – Local Green Tripartite *Danish: Lokale grønne treparter*
LL – Living Labs
KVR – Coastal Water Councils *Danish: Kystvandråd*
MARS – Multifunktionel Arealregistrering
MC – Management Committee
NGO – Non-Government Organization
PA – Project Administrator
PD – Project Director
PLST – Planning and Rural District Agency *Danish: Plan- og Landdistriktsstyrelsen*
PMT – Project Management Team
SAFA– Sustainability Assessment of Food and Agriculture systems
SB – Stakeholder Board
SGAV – Agency for Green Transition and Aquatic Environment *Danish: Styrelsen for Grøn Arealomlægning og Vandmiljø*
SPB – Science-Policy Board
TL – Task Leads
WP – Work Package
WPCL – Work Package Co-Leads
WPL – Work Package Leads
WS – Workshop

1 EXECUTIVE SUMMARY

The TRANSFORM project's purpose is to help solve the land use-related crises; biodiversity loss, eutrophication of the aquatic environments, unsustainable farming systems, and climate change by providing tools and knowledge to underpin the green transition of Danish landscapes aligned with the aim of the Green Tripartite Agreement (GTA).

The mission of TRANSFORM is to establish an interdisciplinary research consortium combining environmental, human, social, agroecological, biological, economic and legal sciences in collaborative, co-creating, action-oriented research. The project applies a Living Lab (LL) approach to speed up development and testing of novel IT tools, land use planning models, stakeholder involvement, and practical implementation of landscape transformation at national and municipal levels, thereby providing the knowledge foundation for a sustainable and comprehensive transformation of the Danish landscape.

TRANSFORM will involve stakeholders in co-creative, collaborative governance and planning processes. This ensures a fast and efficient mutual transfer of knowledge and needs between the project and end-users. Specifically, the project will provide an overview over existing data and data gaps in the land use transformation and use this for a rapid evaluation of land areas most suitable for farming, extensification to alleviate aquatic pollution or different types of transformed farming, protected nature areas and afforestation. The project will develop IT tools to support the decision making regarding possible future land use solutions including spatial optimization. Further, the project will point at barriers and opportunities in regulatory tools, point at crucial experiences from previous land transformations, and will develop novel collaborative planning tools for the transformation plans of the GTA and their implementation. The project will point at alternative farm business models and evaluate land use changes in terms of societal benefits.

LLs will be established in Lemvig, Silkeborg and Lolland Municipalities. The LLs gives the opportunity to test and to upscale implementation of the GTA transformation plans, via novel methods and tools integrating methodologies from several academic realms in collaboration with municipal officials, farmers' association, civil society, NGOs and the Local Green Tripartite (LGT). As a result, the implementation of international and national policies at a local level as stipulated in the GTA can be accomplished.

The consortium has University of Copenhagen as the principal investigator but is led collectively with Aarhus University and SEGES Innovation as main partners. The funded consortium partners include University of Copenhagen, Aarhus University, Roskilde University, Aalborg University, SEGES Innovation, Urland, Mølbak, the Fjordland farmers' union and the Danish Environmental Portal. The municipalities involved, the Ministry of the Implementation of the GTA, Nykredit, Danish Nature Conservation Association, and Confederation of Danish Industry are non-funded observational partners. They provide professional expertise, are key stakeholders and end users. By including the most prominent private and public expertise in landscape-related academic disciplines and practices in Denmark, the consortium is fit for purpose. The individual participants are predominately very experienced senior scientists or senior staff members, with proven record of collaboration in trans-disciplinary land use transformation research and development.

2 BACKGROUND, RELEVANCE AND GAPS

SITUATION

Several global crises face society today – i.e., climate crisis, biodiversity decline, nutrient pollution of the aquatic environment, pollution of groundwater, insufficient water and food supply, new food and renewable energy demands. Land use is a determining factor in all these crises, both at global, regional and local levels.

The current land use in Denmark is not an exception. Farming drives multiple crises; i.e., biodiversity loss through habitat deterioration (Biodiversity Council, 2022), nutrient pollution of the aquatic environment (DCE, 2024), and climate change due to GHG emissions (Gaarn Hansen, 2022). In addition, forestry and urban development contribute to the crises. The needs for land for different and competing uses – e.g., farming, forestry, protected nature, climate mitigation and -adaptation, renewable energy, and urban development - result in intense competition for land areas. The land use development in Denmark is poorly coordinated and there is lack of a comprehensive land use plan. With the present silo thinking, planning for more than one sector at a time is hampered. Comprehensive, multifunctional strategies harvesting synergies in land use, are hard to impose. At present, sustainable development of land use is in a deadlock, as also acknowledged in the GTA (Danish Government, 2024b).

NEEDS

The solutions to the complex and interacting crises require a comprehensive green transition. By land use changes, society can simultaneously alleviate climate change, capture atmospheric carbon and develop GHG negative landscapes, restore and protect nature areas for biodiversity, safeguard areas for sustainable farming, and alleviate pollution of the aquatic environment. This so-called Nexus Approach is stressed in, e.g., IPBES Scoping report for a thematic assessment of the interlinkages among biodiversity, water, food, and health (IPBES, 2021).

The need for land use changes is emphasized in several policy documents from the EU, the Danish Government, think tanks, academic societies, NGOs and business associations. The EU and the Danish Government have formulated policies and demands for protecting up to a total of 30% of the land territory in the EU for biodiversity purposes (European Commission, 2024), significant new wetland areas for nutrient reductions (up to 140.000 ha, Danish Government, 2024a), new forests (250.000 ha in Denmark, Danish Government, 2024a), renewable energy (e.g. at least 24.500 ha of solar panels in Denmark, Danish Government, 2022), and in addition areas for urban development, groundwater protection (Environmental Agency, 2024; Hansen et al.,

2024), flood control (CONCITO, 2024), excavation of raw materials, and recreational areas. Independent advisory councils and think tanks have highlighted the need for a comprehensive land transformation or land reform (e.g., Danish Biodiversity Council, 2024; Danish Climate Council, 2024; CONCITO, 2024). In November 2024, the Danish Government reached the broad political GTA on a comprehensive land use transformation with opposition parties (Danish Government, 2024b). This agreement implies a strong and unmet need to develop comprehensive land use transformation plans in Denmark. These transformation plans must consider synergies among land uses, which can co-exist in land-sharing strategies, and consider land uses, such as protected nature areas, which need protection from other uses, i.e., land sparing strategies (as also emphasized in the Kunming-Montreal Agreement (Convention on Biological Diversity, 2024).

BARRIERS

The land use transformation is challenged by the fact that the landscape is structured and managed based on society's needs of the past. The landscapes of Denmark are dominated by farming and forestry rationales developed in the 19th and 20th centuries. This implies a critical barrier since society's interests in the landscape, such as nature and water protection, clashes with the legal system and land ownership framework, statutory planning and economic incentives. Land regulation measures have proven inefficient: Voluntary schemes lack participation, legal restrictions on land use are too vague, and the statutory land planning is rudimentary and non-strategic. The access to expropriation and public land acquisitions are very restricted. The barriers for comprehensive land transformation are hence numerous. In terms of economy, huge investments are bound in farm buildings, machinery and equipment for a production mode, which may be outdated in the near future. Furthermore, the EU subvention schemes are a determining factor for the farming operations and land prices, which often act in contradiction to the GTA. In the policy and management realms, there is often confusion among administrative areas and levels of governance, widespread silo thinking prevail, policy integration is inefficient and slow processes in Environmental Impact Assessment and land reallotment procedures delay land transformation. Not least, socio-economic and cultural factors may impede the green transition; if solutions are seen as unjust, they will lack social acceptance. The numerous barriers block comprehensive solutions, although technological innovation is at hand, and the knowledge of the biophysical conditions of the landscapes are becoming increasingly detailed.

GAPS

The most prominent research gaps comprise

- access to curated data and dedicated IT tools facilitating the land use transformation
- capability for swift assessment and prioritization of land areas in the transformation process
- rethinking and fitting of the legal framework, landscape narratives to promote comprehensive land transformation planning, new land ownership models and modes of sharing the landscape
- combination of speed in land transformation processes with democratic and participatory planning processes
- development of new farming business models which operate within carrying capacity of the natural environment
- development of economic tools fit for evaluation of policy alternatives in the transformation process

OPPORTUNITIES

The focus of TRANSFORM is to provide a multidisciplinary, comprehensive, action-oriented knowledge base for a transformation of the Danish landscape to sustainability, setting Denmark on track towards a future within the planetary boundaries. The need for changes is of a transformative nature (IPBES, 2019), i.e., a fundamental, system-wide reorganization across technological, economic, and social factors, including changes in paradigms, goals, and values. The political development, the contemporary policy formulation, the political agreement on a land transformation, and the competences of the consortium give a unique opportunity to make profound impact on the concrete implementation of the land use transformation as depicted in the GTA.

With its strong inter- and transdisciplinary approach, the consortium has the potential for a significant contribution to society's demands for strategic planning and thinking based on achievement of national goals through local implementation. Further, the project consortium can contribute to

- the reframing of the intensively used agricultural land and the re-grounding of the farming sector to comply with the environmental standards and surrounding nature
- align the economic subvention and support, land related legislation, statutory planning system and the citizen's involvement infrastructure, with the need to ensure speed in transformation processes
- achieve transparent and efficient economic and ecological evaluation of land use changes.

IMPACT

The impact of the project and accomplishments of its goals are critical for society in the contemporary process of green transition, with specific focus on the land use related transformation which is a demand in the GTA.

As a result of TRANSFORM

- end users have access to co-created IT solutions on land use issues supporting science-based policies and decision making on land transformations
- targets for biodiversity, aquatic environment, climate, and food production are being met and synergies among them harvested
- legal and regulatory frameworks enable a fast land transformation, and are founded on past experiences with land transformations
- planning and governance will be on track to smart land use transformation based on democratic, collaborative processes, fulfilling national and local targets
- land use and ownership are adapted to societal wishes and the local environments and landscapes, and farmers match business models to the landscape and environment
- policy instruments targeted agricultural land use are evaluated efficiently, and contribute to differentiated land pricing as reflection on its societal value

3 VISION, MISSION AND OBJECTIVES

VISION

The **vision of TRANSFORM** is to contribute to a sustainable transformation of the Danish landscape, ensuring that land use practices are within planetary boundaries and meet current and future societal demands

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MISSION

The **mission of TRANSFORM** is to establish an innovative and interdisciplinary research consortium based on environmental, human, social, agroecological, biological and legal sciences for the delivery of collaborative, interdisciplinary co-creating, and action-oriented research.

The consortium will apply a Living Lab approach to speed up development and testing of digital tools, land use planning models, stakeholder and landowner involvement, and practical implementation of landscape transformation at national and municipal levels, thereby enabling a sustainable and comprehensive transformation of the Danish landscape

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OVERALL OBJECTIVE

The **overall objective of TRANSFORM** is to find practical solutions to the land related crises in concrete landscapes in cooperation with stakeholders. Solutions must be scalable and usable in other contexts. The ambition is to support and inform the implementation of the GTA in the land use transformation process by providing science-based policy advice.

The project will use Living Labs as testbeds in which landscape models can be formulated, legal, planning and economic solutions can be developed and integrated in policy development and concrete land use planning. The results must accelerate implementation of the land use transformation of Denmark as it is depicted in the GTA, meeting international and national targets.

An integrated research approach will be used with cooperation between scientists and stakeholders, supported by research on data, landscape models, landscape regulatory conditions, landscape evaluation and landscape designations.

MAIN CATEGORY	OBJECTIVE	WP INVOLVED
AREA-DATA AND IT TOOLS	• establish a catalogue of data relevant to land use change decisions, • co-create spatial decision support tools to test different land use solutions	WP1
LAND AREA POTENTIALS AND PRIORITIZATION	• apply national targets on biodiversity, aquatic environmental conditions, GHG, and a sustainable development of agriculture adapted to environmental carrying capacity. • communicate national targets in local landscapes to LGTs. • enable fast-track land prioritization processes, based on the best available existing knowledge.	WP2
LEGAL FRAMEWORKS AND PAST EXPERIENCES	• rethink the legal framework for land-use change focusing on barriers and opportunities • consider new landownership models • provide insights into past landscape and land use transformation processes.	WP3
PLANNING AND GOVERNANCE	• identify new comprehensive land transformation planning and governance tools, based on collaborative processes, through inclusive, fair and equitable planning processes.	WP4
FUTURE FARM BUSINESS MODELS	• identify sustainable value chains and new farm business models, with a focus on matching farming with local resources and know-how within locally downscaled planetary boundaries	WP5
EVALUATION OF ALTERNATIVE LAND SCENARIOS	• Guide policy design by economic evaluation of alternative scenarios on the choice of transformation instruments on agricultural and forested land.	WP6

4 SCIENTIFIC APPROACH AND KEY ACTIVITIES / WORK PACKAGES

TRANSFORM comprises multidisciplinary action-oriented research in LL, representing real-life cases where the GTA is implemented.

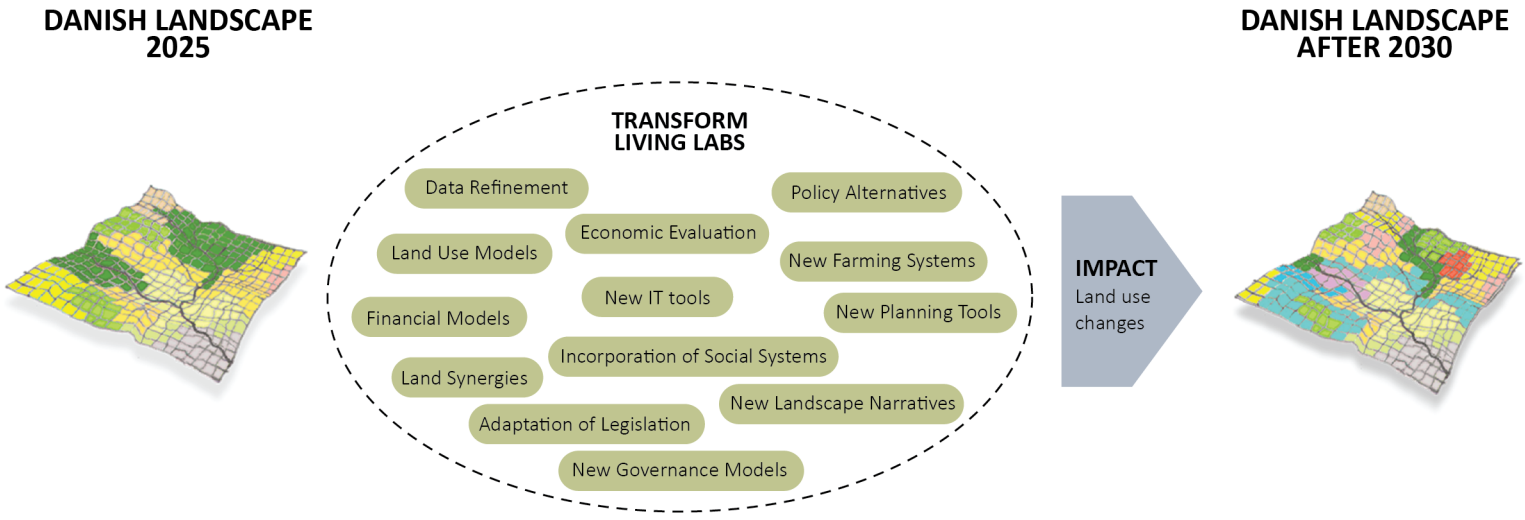


Figure 1. Conceptualization of research and innovation in TRANSFORM. The project (indicated in box) guide and support the transformation of the present landscape.

TRANSFORM considers all land interests, aiming at a coordinated re-distribution of land use at local, regional and national levels. The research content and effort should result in a science-based transformation of landscapes. This transformation comprises legal, economic, cadastral and planning frameworks with the aim of structuring farm properties and farming activities based on environmental standards with a clear priority of areas for nature, protection of the aquatic environment, climate change mitigation and adaptation, and carbon capture.

LIVING LABS (LLs)

As illustrated (Figure 2), the centerpiece of the project is the LLs, enabled by Work Packages (WPs) that in collaboration with local end-users and stakeholders co-create results. Consequently, all project partners are active in the LLs (i.e., the research questions listed in the individual WP descriptions below all relate to LLs).

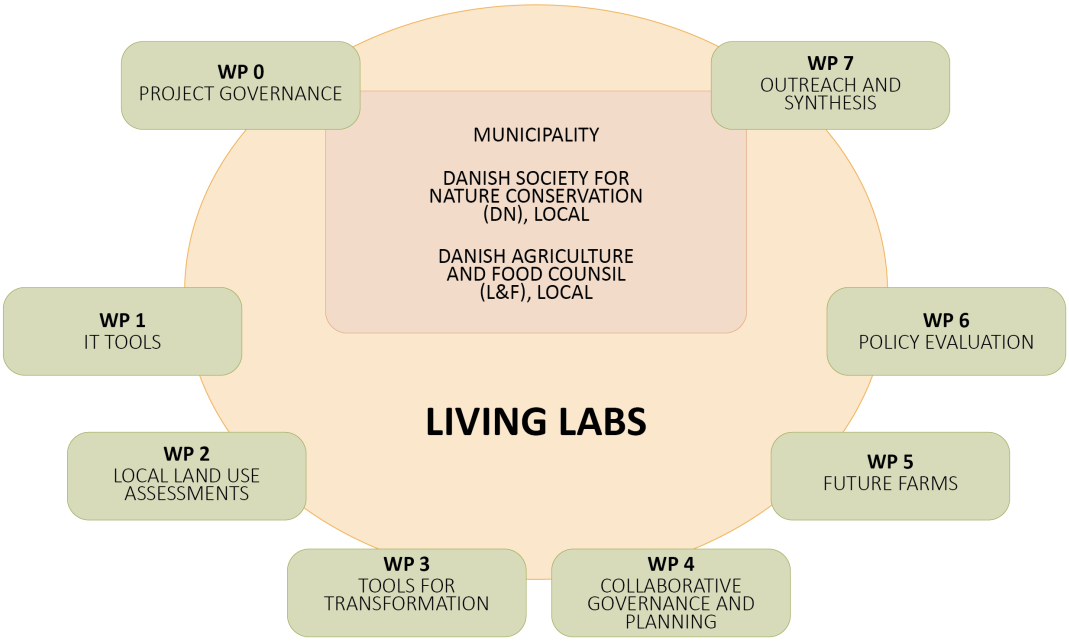


Figure 2. The overall structure of TRANSFORM. The Living Labs (LL) constitute the centerpiece of the project. In the LLs, local actors, such as the Local Green Tripartites (LGT, marked with dark red box), have the task of formulating transformation plans, met with the research and innovation WPs.

WP1 provide data and decision support IT tools to be used in WP2, which evaluate and prioritize the land areas for different purposes, providing fast track solutions in the evaluation and subsequent designation of biodiversity, carbon rich soils, farming areas and areas most prone to N loss to the aquatic environment. This feeds into the work with the transformation plans in the LGTs of the LL, which will be multifunctional in its nature.

The implementation of the transformation plans is the topic of the following WPs. WP3 will harvest experiences from previous land reforms, and investigate barriers and opportunities in regulation, legislation, subsidy schemes, and land reallotment tools. These results inform WP4, which will follow up with collaboratively planned

and co-created concrete projects to implement the aims of the GTA. WP5 will foster the identification of new land-related business models. The environmental-economic evaluation of policy alternatives and business models of WP6 constitutes the backdrop for the whole project.

The overall coordination responsibility of the LLs lies in WP0. The overall outreach responsibility lies in WP7. WP0 and WP7 are in close contact with the LGT governance bodies to ensure project progress and outreach. The LLs hence constitute the key interface between researchers and practitioners and must provide a forum for co-designing innovation and mutual exchange of ideas and needs.

The LLs are established in three municipalities (Figure 3).

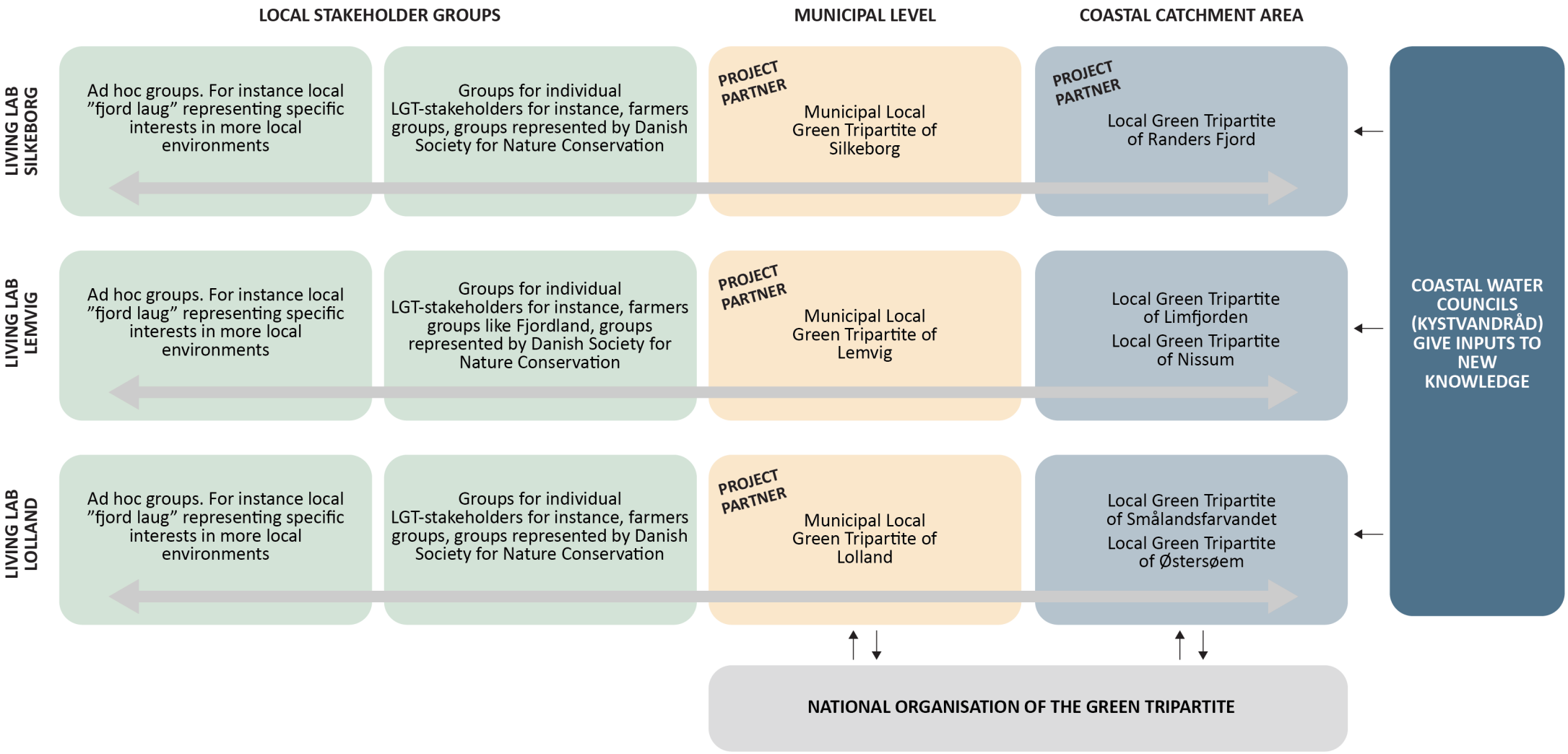


Figure 3: The relation between TRANSFORM and actors related to the LL and the LGT-organization locally as parts of the national GT (main actors in bold). The Coastal Councils are expected to have a crucial role in the future work for the future GT when focusing on the aquatic environment. The national GT-organization in TRANSFORM is described in chapter 6 "Governance and Organization".

According to the GTA, the Danish municipalities bear the legal responsibility for the formulation of transformation plans (Danish: Omlægningsplan). The municipalities of the TRANSFORM LLs are Lemvig, Lolland and Silkeborg, the latter hosting the secretariate for the Randers Fjord LGT (see also Figure 4), with participation of eight municipalities in total. The criterion for choosing the LLs is a combination of geographical setting, local municipal administrations open for cooperation, farmers associations willing to collaborate, and a strategic choice to have the typical regulatory challenge represented; i.e., a farming sector and a landscape in need for profound changes due to environmental challenges. Lemvig represents a very diverse geology and very vulnerable marine recipients. Silkeborg and the Gudenaa/Randers Fjord catchment represent a diverse geology and huge potentials for nature restoration, biodiversity efforts. Lolland represents highly valuable farmland with vulnerable recipients.

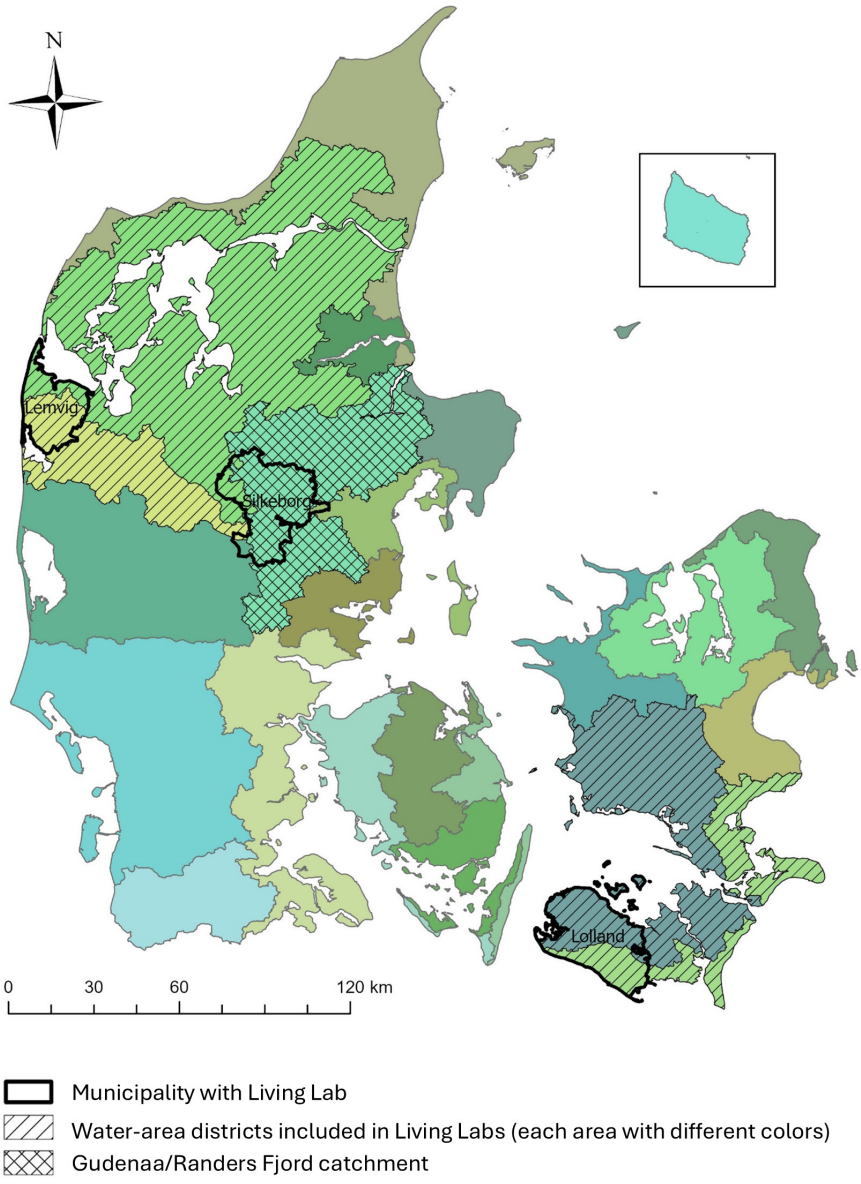


Figure 4. Map showing the catchment areas of Denmark, the three Living Lab municipalities, and the Gudenaa/Randers Fjord area.

The LGTs in the LLs consists of representatives from the municipalities, the governmental Nature Agency, local representatives from Danish Society for Nature Conservation, and the local branch of Danish Agriculture and Food Council. This forum is in close dialogue with the WP- and Task Leads (TLs) of TRANSFORM and will create synergy for the sustainable transformation of the Danish landscapes. The Green Tripartite stakeholders are supplemented with other relevant stakeholders in the actual work of the individual WPs.

The research approach in the LLs is an action-oriented and co-creative methodology. This methodology is illustrated in Figure 5 below including the co-creative activities and common reflections as well the interaction between these activities and the stakeholder- (insider) and researcher-environment (outsiders) respectively.

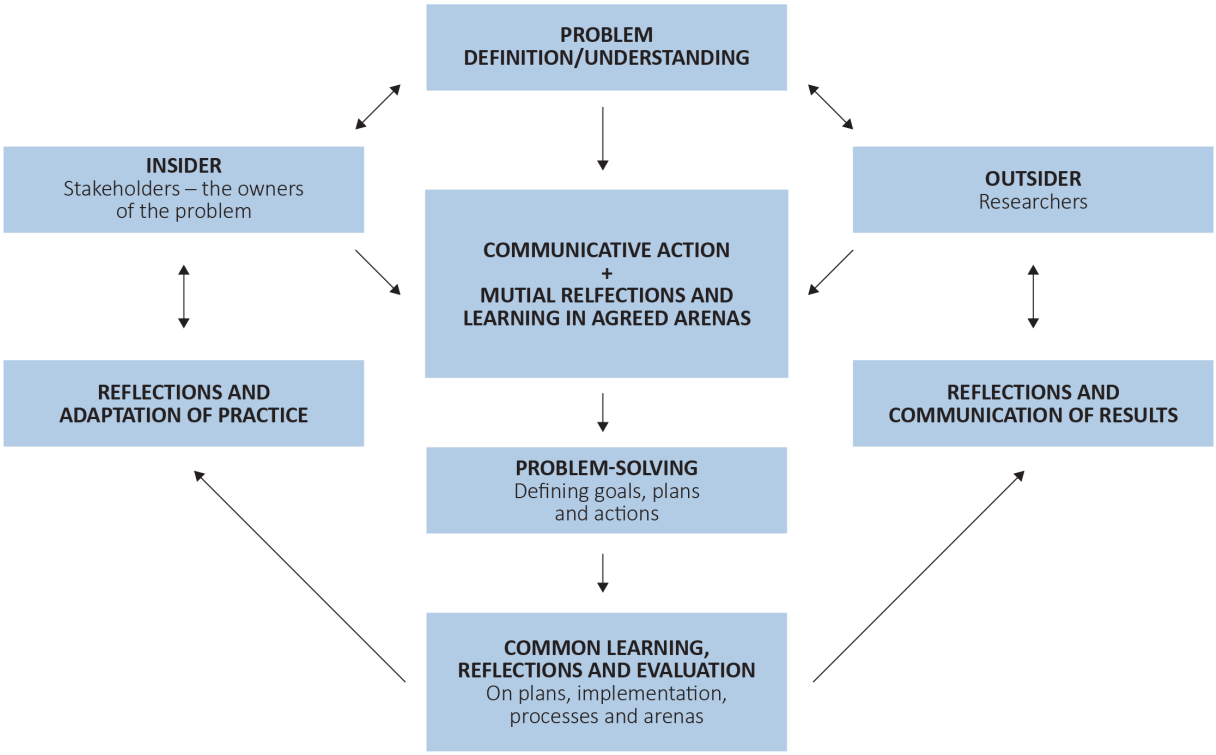


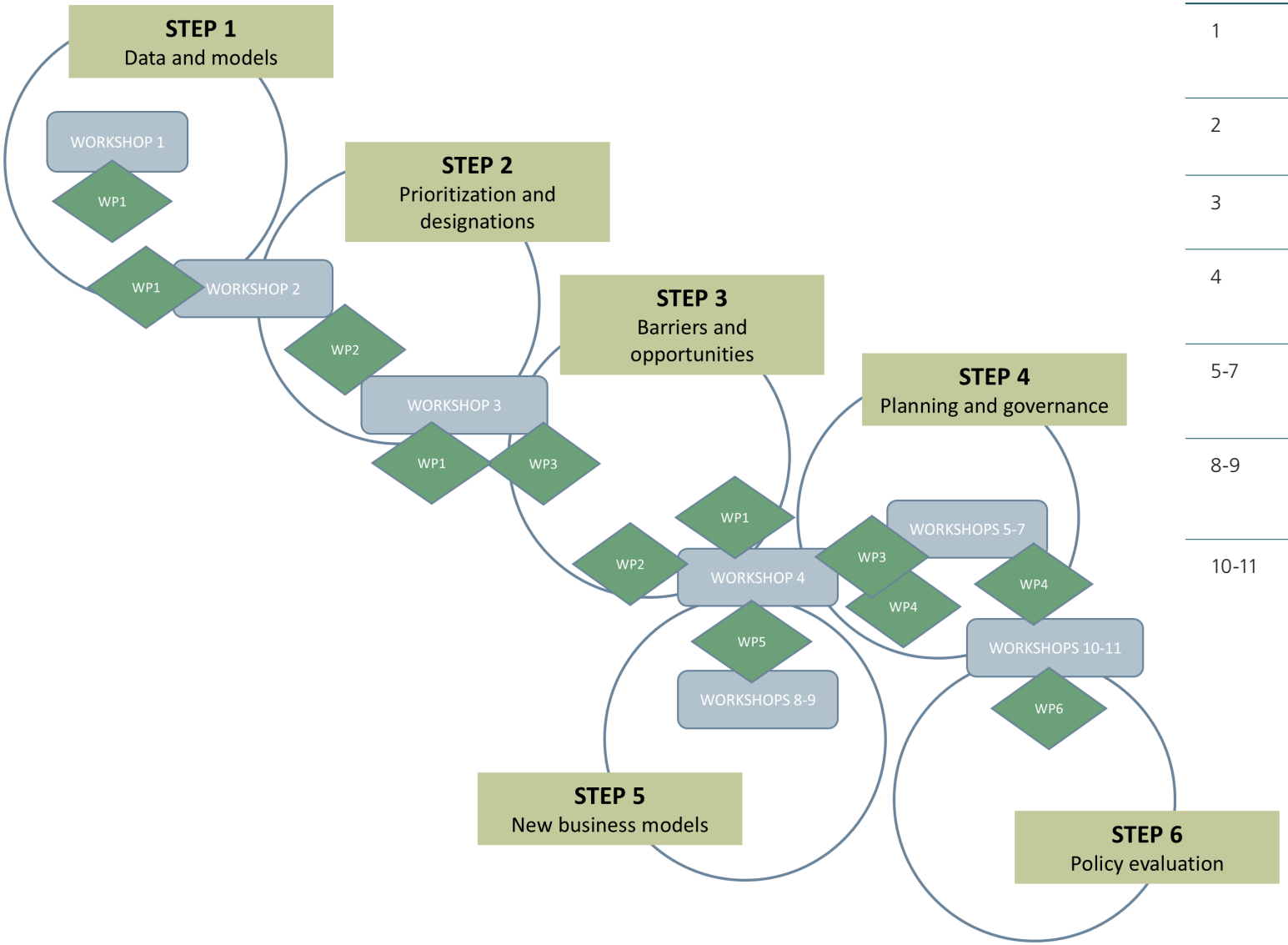
Figure 5. The Action Research model with examples of co-actions activities as implemented in TRANSFORM (After Greenwood and Levin, 1998).

LLs are understood as a method designed to create space for innovative, explorative, and involving processes focusing on the need of end-users (Hossain et al., 2019). The design of LLs aims at creating interchanging environments with participants from public authorities, academia, businesses, civil society, and landowners. All participants are included in a dialogue about the common project. LLs provide a space for development and sharing of new knowledge in a practitioner focused setting which is critical for successful transformation (Lamine et al., 2019 & Sachet et al., 2021). The TRANSFORM LLs is based on a cross-disciplinary approach, aiming at building mutual trust and respect for different competencies, perspectives, interests and positions.

LLs are not only concrete spaces, but is a structured approach to co-creation, which through iterative processes are adapted to ensure co-learning around mutually defined goals. The LL design is based on curiosity and adaptation, with flexibility to ensure development of frames and tasks. LLs cater for cooperative, involving processes designed to create dialogue, which defines the project framework. LLs have the aim of mutual learning and common development of plans, recommendations and solutions.

The role of the LLs is to act as testbeds for the implementation of the land transformation as depicted in the GTA. Figure 6 depicts the workflow in the LLs. During all steps practitioners and researchers meet in workshops and co-create solutions on the implementation of the GTA. In the first step, suitable land related data are identified, and IT solutions are formulated in cooperation with the municipal officials and the LGT as established according to the GTA. In the second step, land areas in the LL are evaluated, prioritized and designated for extensification, biodiversity, nutrient loss reduction in collaboration with the LGT. In the third step, barriers and opportunities in legislation and regulation are identified in collaboration with the LGT, landowners and NGOs. In the fourth step, new methods in collaborative planning and governance are developed in collaboration with the LGTs, citizens groups, landowners and other stakeholders. In the fifth step, new business models for the farming sector are developed in collaboration with local business associations, farmers associations and local retail associations. In the sixth step, policy alternatives are being evaluated in collaboration with the LGTs.

Workshops are the main activity in each step is the workshops in which local stakeholders meet with scientists and innovators. Some workshops are held in each of the three LLs, some are held as common workshops with all three LLs.



WORKSHOP	THEME	LOCAL PARTICIPANTS
1	Data and IT interface	Municipal and government officials. Local Green Tripartites
2	Data employed in area priorities	Local Green Tripatites
3	Area priorities, former land uses	Local Green Tripatites
4	Barriers and opportunities in relation to planning and land use	Local Green Tripartites, land owners, citizens, NGOs
5-7	Collaborative planning of the future land use	Local Green Tripartites, land owners, citizens, NGOs
8-9	Identification and promotion of new business models	Farmers associations, business organizations, retail organizations
10-11	Policy evaluation of scenarios and plans	Local Green Tripartites

Figure 6. The workflow in Living Labs, consisting of six steps with associated workshops. The flow reflects the Green Tripartite Agreement (GTA) elaboration of transformation plans for their local landscapes. The table shows the stakeholders participating in workshops.

WORK PACKAGES

TRANSFORM is a large research and innovation consortium, which addresses pressing societal challenges in an extremely dynamic policy and governance context, with a strong responsibility for efficient and targeted communication. Hence, the project has a dedicated governance WP (WP0), and a dedicated synthesis and outreach WP (WP7) fit for rapid changes in governance and communication needs, and six research WPs.

4.1
WP0 PROJECT GOVERNANCE

Lead: Henrik Vejre; Co-Leads: Irene Wiborg, Tommy Dalgaard

Partners: KU-IGN, SEGES INNOVATION, AU-AGRO

OBJECTIVES

WP0's first overall objective is to provide efficient, strong and transparent internal coordination and management of the project and its dedicated resources. The second overall objective is the coordination and integration of the outcomes of the project to ensure coherent and timely implementation. WP0 will coordinate all activities in the LLs in collaboration with LGTs and Work Package Leads (WPL). Information flows within and between different WPs will be overseen by WP0, with a special focus on the supply of necessary data and information for LLs and their final application in science-based policy advice and decision-making.

The specific objectives of WP0 are to:

- provide overall project coordination and management, facilitating a dynamic and adaptive implementation of the project and its results, ensuring effective integration of all WPs
- provide overall coordination and management of the activities in LLs to safeguard integration of all partners in LLs.
- establish and maintain smooth relationships and communication between the project team and the funding bodies
- administer project resources efficiently and monitor performance, taking account of risk factors and coordinate scientific, impact and financial reporting of the project
- define and ensure clear compliance with project data management and intellectual property rights policies
- foster smooth relationships and communication between the WPL, Work Package Co-Leads (WPCL) and WP TL and the LLs
- Establish and maintain the Scientific Advisory Board (SAB)

The responsibilities of WP0 will be unfolded in the following tasks:

TASK 0.1 INTERNAL COORDINATION (M1-M32)

This task will establish and maintain a dedicated Management Committee (MC) for the day-to-day operational and financial management of the project, according to the Governance and Organization principles (Chapter 6). Task responsibilities include the development of a common reporting strategy, regular communication with all partners and across WPs, progress monitoring, and the timely submission of the deliverables. A Content Management System (CMS) including a Decision Log will be installed at the beginning of the project and run for the whole project duration. The CMS comprise an internal web space serving the exchange of information, data, project results, coordination decisions, meeting protocols, reports and other relevant information. Further, this task formulates a management plan and oversees management and governance structures for the project and follows the overall performance of the project; including the appropriate completion or termination of the project. The task ensures that governance and management structures are created according to the principles of the Governance and Organization part. The performance of the management structures and processes will be reviewed regularly under this task by self-assessments and adapted if necessary.

TASK 0.2 PROJECT QUALITY MANAGEMENT (M1-M32)

This task ensures the quality of the project by assessing the consortium's work and interaction with relevant stakeholders. The key performance indicators will be followed as guiding principle. Regular self-evaluations of the project will be carried out. The outcomes from the evaluations and consultations will be communicated to the consortium and utilized in the regular revisions of the project's implementation plan. This task includes controlling the quality of the work and deliverables, the completion of the specified project tasks and objectives, safeguarding an efficient and timely development, validation and implementation of WP results and timely and compliant reporting to the funding bodies. This task formulates a publication agreement with all partners.

TASK 0.3 LIVING LABS (LLS) COORDINATION (M1-M32)

This task will ensure smooth information flows between all project partners and the staff in LLs. The overall coordination and management of the activities in each LLs is subject to a Memorandum of Understanding. The task plan and coordinate the WSs of the different WPs (Figure 6).

The task will maintain close contact with the municipal officials who are official representatives for the three LLs in Lemvig, Silkeborg (Gudenaa catchment) and Lolland municipalities. The task will maintain close contact with the LGTs in the three municipalities. The work in LLs will be guided by Memoranda of Understanding with each LL. These efforts aim at keeping participants in LL engaged for the whole duration of the project.

TASK 0.4 SCIENTIFIC ADVISORY BOARD (SAB) (M1-M32)

This task establishes and maintains the SAB as described in the Governance and Organization structure (Chapter 6). The SAB comments, inspires and guides the academic content and progress of the project. SAB meets annually. The topics for meetings comprise the overall project results, with point of departure in progress reports.

DELIVERABLES

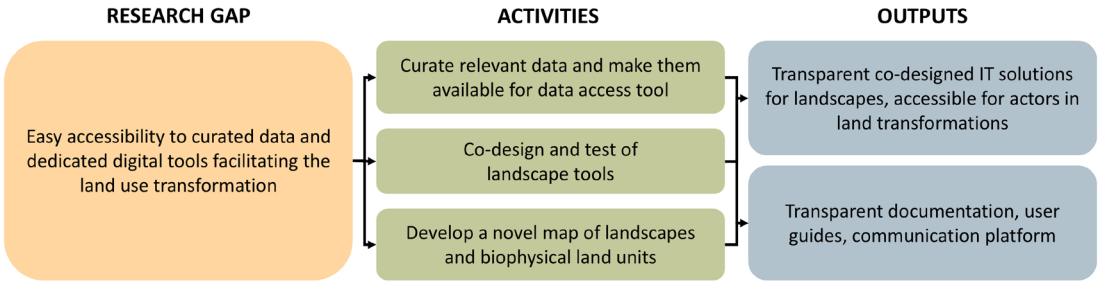
- D0.1 Management plan (M1)
- D0.2 Memorandum of understanding with LLs (M2)
- D0.3 Designation of participants in and plan for involvement of SAB (M4)
- D0.4 Publication agreement among partners (M4)
- D0.5 Self-assessment I and revised management plan (M6)
- D0.6 Self-assessment II and revised management plan (M14)
- D0.7 Project termination and legacy document (M32)

4.2
WP1: IT-TOOLS FOR LAND TRANSFORMATION

Lead: Erling Andersen

Co-leads: Andreas Aagaard Christensen and Nils Høgsted

Partners: KU-IGN, DEP, RUC, SEGES INNOVATION, AU-AGRO, KU-IFRO



OBJECTIVES

The aim of WP1 is to facilitate science-based, data driven policy and decision-making for land use transformations by providing access to state-of-the-art data and tools to alternative future land use solutions and the evaluation of effects on biodiversity, aquatic environment, climate mitigation, carbon-rich soils, agricultural production and other key issues.

Denmark is, with few exemptions, a world leader regarding data density, diversity, and accessibility with respect to land use, land cover and environmental monitoring. However, there is lack of consensus on which data are needed to facilitate policy- and decision-making on future land use transformations and there is a need to assess the quality of the available data. A general problem is lack of knowledge about how to combine existing data to provide insights on the feasibility and effects of different land use solutions. There is also a lack of dedicated tools that can support data-driven decision-making regarding options for future land use at a level matching the decisi-on-making scale of local land users. Tools currently available either have limited functi-onality and precision or are designed for research applications and do not address the needs of land use decision makers. Finally, there is a lack of maps combining multiva-riate data across sectors and scientific disciplines when addressing conditions, effects and impacts of land use practices for direct decision support where stakeholders seek sustainable land use solutions.

To address these research gaps, the specific objectives of WP1 are to:

- establish a science-based overview of data relevant to land transformation decisions and effect estimates and curate a data collection available in a webservice. The service will support LLs and will be open to all potential users, including public organizations and private businesses developing IT solutions.
- co-create spatial decision support tools to assess different land use changes to support the decision-making process in the LLs and relevant authorities and actors. The specific tools will depend on the co-creation process in WS1 and 2 (Figure 6). However, it is envisaged that different tools will be needed at various stages of the implementation of the GTA. The tools will combine selected datasets relevant to land transformations in an integrated map interface with decision support functions for assessing land use solutions. The tools will also allow for system-to-system integration in the public and private sector developing IT solutions to take advantage of the services developed.
- develop a novel map of Danish landscapes delineating land units with relatively homogenous conditions for land use. The map will be tested and aligned with the needs of the LLs and other relevant actors. This will provide a novel spatial framework for managing future land use and for evaluating environmental impacts and estimating land use efficiency for land use transformations in the LLs and in Denmark in general.

OVERALL APPROACHES

Similar land use practices have different environmental impacts depending on where in the landscape they are located (Antrop, 2000; Aznar-Sánchez et al., 2019). This is why land use changes are currently envisaged politically as a key component of sustainable transition in Europe (EC, 2021) and in Denmark (Danish Government, 2024). Achieving more optimal land use based on better use of the available land requires access to relevant high-quality data and tools to test alternative land solutions (Christensen et al., 2021). To this end, WP1 will critically review and curate data into a collection of vetted datasets and indicators. A range of tools to support decision-making on land use is available already for Denmark e.g. Udtagningskortet and EA-Tools. Other tools are developed in academic environments e.g. TargetEcon and Skovsynergikortet. Building on such initiatives, WP1 will bridge the gap between scientific tools and those used in public administration to facilitate science-based decision making. Finally, WP1 will develop a novel landscape map integrating multivariate data across sectors and scientific disciplines. TRANSFORM will work closely with KL-Local Government Denmark and the Agency for Green Transition and Aquatic Environment to align with ongoing initiatives to provide land use related data and tools for the green transition. We aim to make data and tools available through MARS, the governmental IT platform supporting the implementation of the GTA.

RESEARCH METHODS AND ACTIVITIES

The activities in WP1 are divided into three tasks concerning data, tools, and landscape mapping, respectively. Both the task on data and on tools will use co-creation methods to ensure usability and quality of the task outputs. The landscape mapping task will use field data and remotely sensed data for validation, and the usability of the mapping will be tested in LLs.

TASK 1.1 IDENTIFY RELEVANT DATA AND MAKE THEM AVAILABLE IN A DATA ACCESS TOOL (M1-M32)

This task will identify data needs and data gaps for the coming land use transformations in collaboration with the LLs, the LGTs, with LLs national stakeholders and on-going projects and initiatives on the subject (including close coordination with Task 2.1, see below). Based on this, the relevant data and metadata will be critically reviewed and rated based on data quality indicators (i.e., inter-dependency, redundancy, precision, accuracy, observation scale, bias, relevance etc.). Data will be made accessible in MARS to ensure a common data foundation across the authority bodies and among the different actors in the land transformation process with a focus on data not readily available today. The data, metadata and services will be tested continuously in LLs. The data included will comprise both data generated in the different WPs and existing data and combinations of these where relevant. The webservice will also include extensive metadata and factsheets on selected key data for the land transformation.

TASK 1.2 CO-CREATION AND TESTING OF DECISION SUPPORT TOOL (M1-M30)

In Task 1.2 we will co-create decision support tools in collaboration with, and based on the needs of, the LLs and regional and national actors in the land transformation. In the first phase (M1-M6) we will co-create mock-ups of the tools targeted at the different user groups. Simultaneously, we will develop the first prototype of the tool supporting the elaboration of the transformation plans of the LGT. In the second phase (M7-M18) we will, in collaboration with end users in WS4 (Figure 6), provide tools that can support the actors involved in implementing land use projects at individual farm level as well as collective projects involving more farmers or landowners. If needed, a tool supporting the LGTs in facilitating the land transformation will also be developed. In phase 3 (M19-M30) we will broaden the scope, adding additional land use options, targets and priorities to the tools, including outputs from WP2 and 6. This will also integrate the novel spatial landscape map developed in Task 1.3 in the tools where relevant.

TASK 1.3 DEVELOP A DIGITAL MAP OF DANISH LANDSCAPES AND LAND UNITS (M1-M26)

Task 1.3 will deliver a landscape map of Denmark, integrating multivariate data. This will be done by delineating landscape systems consisting of land units forming patterns which have relatively homogenous conditions for land use. The novel landscape map will build on existing data on factors affecting land use conditions in Danish landscapes. This will provide a novel multivariate landscape model able to support estimation of site dependent delivery of ecosystem services from land areas subject to current and future land use. The landscape map will be tested in the LLs and validated empirically in situ and based on satellite imagery.

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES

WP1 will integrate the assessment maps and the fast-track results from WP2. IT tools will be co-created and tested in the LLs in close cooperation with WP4. The WP5 farm business models will be integrated into different land use solutions formulated in WP1. WP6 policy simulations will be made available in the data access tool developed by WP1.

DELIVERABLES

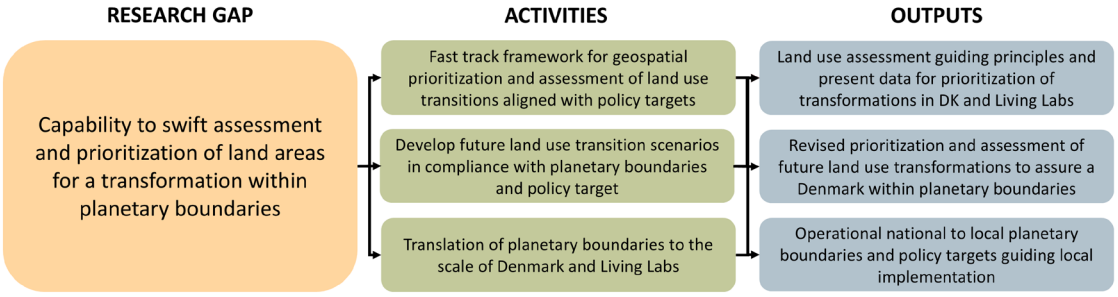
- D1.1: Final version of data viewer and data access tool on landscape data (M18)
- D1.2: Final versions of decision support tools for landscape transformations (M28)
- D1.3: Validated landscape map of Denmark (M26)

4.3
WP2 LAND USE ASSESSMENTS - FRAMEWORKS FOR LOCAL TRANSFORMATIONS TOWARDS SUSTAINABILITY TARGETS

Lead: Tommy Dalgaard

Co-leads: Signe Normand, Hans Henrik Bruun, Martin Rudbeck Jepsen

Partners: AU-AGRO, AU-BIO, KU-IGN, KU-BIO, SEGES INNOVATION, KU-IFRO



OBJECTIVES

The overall aim of WP2 is to provide a capability for swift, geo-spatial assessments of key effects from land use transformations, and thereby a framework for prioritizations in the LGT transformation plans, and an evaluation of their contributions to the national scale land use policies for a green transition within planetary boundaries and existing policy targets.

The specific objectives are to:

- Provide guidelines for fast-track assessment and prioritization of the effects of land use transformations, including key impacts related to biodiversity, aquatic environment, climate mitigation, carbon-rich soils and agricultural production, relevant for national sustainable development targets and, thus, for regional and local prioritization.
- Model scenarios for future type and location of land uses in Denmark when land-use related policy targets are to be met. This includes targets from the EU Water Framework Directive, Biodiversity Strategy and Nature Restoration Law, the Kunming-Montreal Protocol on Biodiversity, and the GTA.
- Downscale the planetary boundaries framework, global and European political goals and targets, to the national level and potentially to the municipal level to keep land transitions within science-based boundaries and targets.

OVERALL APPROACHES

WP2 will define guiding principles for the development and assessment of the transformation plans (Task 2.1), supported by scenarios and frameworks for the compliance with planetary boundaries (Task 2.2 and Task 2.3., i.e., relating to the earth system sustainability boundaries within which humanity can maintain a safe operating space (Richardson et al., 2023). The sustainability impacts assessments include four key dimensions: i) Biodiversity, which will take advantage of experiences from the Danish Biodiversity Council (Danish Biodiversity Council, 2023) and the ongoing prioritization and optimization of biodiversity restoration potentials in the Sustainscapes.org Center for Sustainable Landscapes Under Global Change, as well as the recently developed Danish Nature Indicator. ii) Clean Water, including the significant potential in geographically targeted land transformation (Hansen et al., 2024), and various measures for reduced pollution in general (Dalgaard et al., 2017), iii) Targeted Climate Actions, e.g. changed management of carbon-rich soils, afforestation etc., and iv) Transformation of the agricultural production system; both in synergy with parallel research in our Land-CRAFT.dk Center for Landscape Research in Sustainable Agricultural Futures and related national as well as international activities (e.g. Andersen et al., 2023; Dalgaard et al., 2023; Dalgaard and Butterbach-Bahl, 2022). The results in WP2 emerge from three tasks:

TASK 2.1 FAST-TRACK ASSESSMENTS AND PRIORITIZATION OF EFFECTS OF TRANSFORMATIONS AT THE SCALE OF DENMARK AND LLS (M1-M28)

With the objective to provide guidance for LGT data source selection and use, a set of available area data is identified and developed for use in localized land use impact assessments. Thereby, an overview of existing land use relevant data with national coverage is created for use in guidance of the LGTs for the development of transformation plans in relation to biodiversity, water/environment, climate/carbon in soils, and agricultural production systems (WS2 and 3, Figure 6). Farm activity data are collected to assess the combination of agriculture and local biodiversity, environment and climate targets, including potential synergies between transformations to more Nature-based Solutions (e.g. via more grassland and permanent crops, afforestation, biobased fertilizers, energy production and set aside; Dalgaard et al., 2023, trans4num.eu), in combination with benefits from long-term sustainability and knowledge about the cultural landscape (Lohrum et al., 2024).

TASK 2.2 FUTURE SCENARIOS WITHIN PLANETARY BOUNDARIES AND TARGETS (M9-M30)

An increasing number of policies and political strategies include wishes or demands for future land uses. Recent analyses have shown that to meet the national target of at least 20% protected nature; virtually all areas not currently cultivated would have to be included in a network of protected areas and be connected through targeted retirement of farmland (Danish Biodiversity Council, 2023). In concert with WP3, Task

2.2 will produce a comprehensive updated catalogue of land use policy targets and inventories of spatial demands on land use. We will use these land targets and demands as inputs to a spatially explicit dynamic land allocation model (ClueMondo et al., 2012) to model scenarios for potential locations of different land uses in compliance with land use related policy targets, and their (potential) synergies or conflicts in cooperation with the LGT in WS4 (Figure 6). The outputs will identify the type and location of specific land use changes needed to meet the policy targets. The model has been developed for scenario analyses of the impacts of policies on land systems (Levers et al., 2024 & Ornetsmüller et al., 2016). The scenario outputs will be used in science-policy dialogues to inform decision-makers at national and municipal level about the land use implications of existing policy targets.

TASK 2.3: FRAMEWORK FOR DOWNSCALING PLANETARY BOUNDARIES AND POLICY TARGETS TO NATIONAL AND SUB-NATIONAL LEVEL (M1-M32)

Based on the concept of the planetary boundaries, we will build on existing approaches to develop a coherent methodological and conceptual framework for downscaling the global planetary boundaries and relevant policy goals and targets to Denmark and if possible, the scale of relevance for municipal decisions in the LGTs (WS4, Figure 6). The degree to which the planetary boundaries are transgressed globally is assessed yearly (Planetary Health Check, 2024). To act as decision-support, the planetary boundaries, and national policy targets for area share of protected nature, need to be downscaled to national and sub-national levels. This has been attempted for some planetary boundaries, e.g., for biogeochemical cycles (Nitrogen), by spatially explicit models (Schulte-Uebbing et al., 2022). The developed framework will be applied to provide boundaries and guidelines for a transformation within the planetary boundaries at national and sub-national level.

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES

The fast-track results from WP2 will be delivered to WP1 and WP4, and subsequent advances during the project will be reported. Scenario results from WP2 will be reported for use in the WP4 and WP5 LL activities and national studies, integrated with the economic impact assessment and the TARGETECON modelling in WP6, and the testing of scenarios in WP6. W2 thereby coordinates model input data with WP6 to harmonize modelling efforts and will also be informed by potential legal barriers to land use changes from WP3. The localized planetary boundaries of WP2 will be applied to evaluate scenario outputs, and the boundaries and guidelines will be discussed with policy and decision-makers at national level, and with the LGTs, municipal planners and local landowners. Results will be reported for use in the LLs and in national studies.

DELIVERABLES

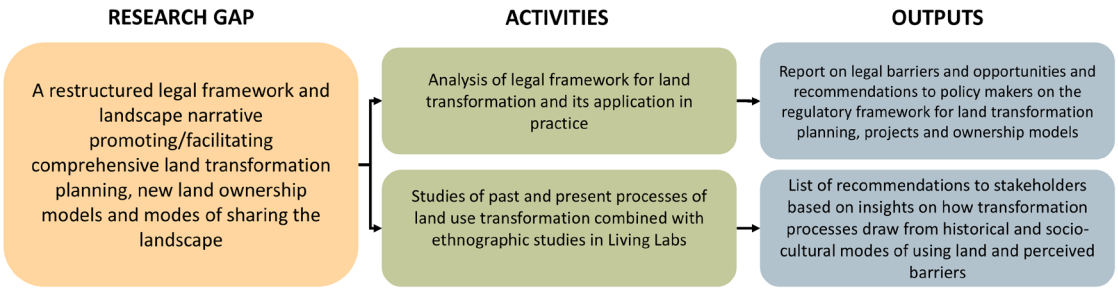
- D2.1: Report describing the science-based guiding principles behind the fast-track prioritization of data and assessment of land use transformations to be developed in Task 2.1. The report will provide full transparency on why and how the specific datasets are planned to be used and can serve as inspiration for LGTs (M5).
- D2.2: Science-based guiding principles and geospatial framework peer-revived and published (M25). D2.3: Publication of developed future scenarios and the revised prioritization of future land use transitions in compliance with policy targets and the planetary boundaries (M28).
- D2.4: Planetary boundaries and policy targets down-scaled to national and municipal levels peer-reviewed and published (M30).

4.4
WP3: LEGAL FRAMEWORK, LAND OWNERSHIP MODELS AND LAND USE HISTORIES – TOOLS FOR TRANSFORMATION

Lead: Helle Tegner Anker

Co-leads Karsten Willeberg, Signe Skjoldborg Brieghel

Partners: KU-IFRO, KU-IGN, KU-Saxo, KU-IVH, AU-AGRO, Mølbak



OBJECTIVES

WP3 will analyse the legal framework and its application in practice with the purpose to identify barriers, opportunities and needs for adjustments of the legal framework for land transformation, particularly land-use change of current agricultural lands into, e.g., forest, nature areas, and wetlands. This analysis is mainly a legal analysis drawing also on LL experiences as well as previous stakeholder surveys. Furthermore, cultural history and ethnographic studies of LLs will provide qualitative insights into the historical and societal conditions of ecological change (Swanson et al., 2021), the point being to foster a more reflexive and multi-facetted discussion on possible visions for future landscapes at both state and municipal levels.

RESEARCH METHODOLOGY AND ACTIVITIES

WP3 is divided into two sub-WPs; 3.1 and 3.2, which combine legal and cultural analysis to provide the insights needed for rethinking current legal frameworks and socio-cultural narratives for land use. From these two sub-packages (outlined below) WP3 brings a locally sensitive and empirically rigorous approach to studying the legal and societal structures that underpin current unsustainable land uses in Denmark.

WP3.1 LEGAL FRAMEWORK AND LAND OWNERSHIP MODELS (M1-M18)

The analysis of the legal framework is based on relevant legal documents, including preparatory works and case law, as well as local experiences, in particular in LLs. WS3 and 4 (Figure 6) which include LGTs, national and local authorities, business organisati-

ons, NGOs, and consultants will be used to test and refine the findings, including new models and recommendations for adjustments of the legal framework.
The analysis of the legal framework will focus on the identification of barriers, opportunities and necessary adjustments with a particular focus as described below.

TASK 3.1.1 LAND TRANSFORMATION PLANNING (M1-M28)

The legal analysis will identify the interlinkages and potential 'mismatch' between different planning instruments and requirements at EU and national level, including 'environmental planning' (e.g. Natura 2000 and River Basin Management Plans), spatial planning (e.g. national and municipal planning) as well as 'sectoral or infrastructure planning' (e.g. renewable energy, climate adaptation). Different legal models for a new comprehensive land use planning tool will be identified aimed at achieving synergies across sectors and levels of authority. This task is involved in WS5-7 (Figure 6).

TASK 3.1.2 LAND TRANSFORMATION PROJECTS (M1-M16)

This task analyses the complexities in legal framework on environmental assessment and nature protection requirements with a particular view to potential barriers and opportunities that may determine the success of e.g. afforestation, climate adaptation or wetland and nature projects. Furthermore, the regulation of agricultural cultivation practices, including both mandatory requirements and voluntary subsidy schemes (carrot and stick) in view of general principles of law, including property rights. This task is involved in WS5-7 (Figure 6).

TASK 3.1.3 LAND OWNERSHIP MODELS, RIGHTS AND DUTIES (M1-M24)

Development of new land ownership models, including collective ownership, is crucial to transformation of agricultural lands, and to secure ownership and maintenance of, e.g., new nature areas. Legal opportunities and constraints regarding new landownership models with redefined responsibilities, as well as land reallotment, acquisition and expropriation will be identified and analysed to facilitate sustainable land transformation.

WP 3.2 LAND USE HISTORIES AND EXPERIENCES

The studies of past and present processes of land use transformation will follow a two-pronged methodological approach. Firstly, a cultural historical analysis of past land use transformation processes will ensue, based on archival material and historical documents publicly available from state and municipal institutions (e.g. The Royal Danish Library, Rigsarkivet, local historical archives in testbed municipalities, and digital databases). Specifically, this analysis will focus on past large-scale land-use changes and the embeddedness of such transformations in particular discourses of agricultural productivity and economic growth (Fritzbøger, 2002; Hastrup & Lien, 2022). Secondly, ethnographic case studies will be carried out, partly in LLs in WS4 (Figure 6). These

studies will produce qualitative insights into current land use patterns and discussions, asking how transformations (e.g., afforestation or wetland projects) draw from – or work against – historical and socio-cultural modes of using, valuing, owning and partitioning land.

TASK 3.2.1 CULTURAL HISTORICAL ANALYSIS OF PAST LANDSCAPE AND LAND USE TRANSFORMATIONS (M1-M18)

Insights into past transformations are crucial, because they show how state-driven landscape transformations have affected local life modes and vice versa. Further, the historical cases show how changes in the physical landscape hinge upon broader societal, cultural and legal structures (Tsing, 2017). Overall, a sensitivity to prior land-use change can help show that land use is an inherently dynamic social and historical phenomenon and can indicate potentials and barriers for current efforts. Detailed qualitative descriptions of selected historical cases will be used as props for discussions in the LLs WS4 (Figure 6).

TASK 3.2.2 ETHNOGRAPHIC CASE STUDIES IN TESTBED MUNICIPALITIES AND LIVING LABS (LLS) (M4-M18)

Qualitative cultural analysis of concrete land transformation processes in LL will be carried out to identify social and legal barriers in an everyday setting among LL stakeholders. Through the ethnographic methods of interviews and participant observations we explore current land management and implementation processes, how legal frameworks are perceived, and how historical narratives for land use are mobilized. This latter methodological approach will further inform work across WP4 and 5 where issues of concrete implementation in LL are at stake.

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES

WP3 will contribute to the LLs with legal and ethnographic expertise drawing also on the insights gained in the LLs on planning, management and implementation issues. Furthermore, WP3 has strong linkages with the other WPs, particularly WP4 where WP3 will inform regarding the legal constraints and opportunities in collaborative planning and receive feedback from the WP4 experiences in the LLs. WP3 will also contribute to WP5 regarding barriers, opportunities when developing farm business models. WP3 contribute to the WP6 policy evaluations as regards the development of new tools and regulatory instruments for land transformation.

DELIVERABLES

- D3.1 Report on legal framework for land transformation planning tool (M18)
- D3.2 Report on barriers and opportunities for land transformation projects (M16 and article M28)
- D3.3 Inspirational catalogue selected cases that show critical links between historical land use transformations and current land-use dilemmas (M8, M13)
- D3.4 Report on historical and socio-cultural modes of using, valuing, owning, and partitioning land (M15, M24)

4.5
WP4 COLLABORATIVE PLANNING AND GOVERNANCE

Lead: Lone Kristensen

Co-Leads: Miriam Jensen, Morten Graversgaard, Stine Krøijer

Partners: KU-IGN, KU-IFRO, KU-BIO, KU-SAXO, KU-IVH, KU-Anthro, AU-AGRO, AU-BIO, SEGES INNOVATION, RUC, AAU, Fjordland, Urland, Lemvig Municipality, Lolland Municipality, Gudenaa Committee, Velas, VKST and Gate 21

OBJECTIVES

The overall objective of WP4 is to develop a core governance approach for implementing the GTA, including collaborative processes that facilitate and ensure democratic and successful design and implementation of land-use transformation plans.

The GTA prescribes a relatively short and rapid time frame for the planning of the implementation of the needed land use transformation. However, coordinated implementation of land use transformation demands collaboration between diverse, and sometimes, divergent stakeholder perspectives, which often require a prolonged amount of time for deliberating between interests (Greenwood and Levin, 1998). A core challenge for WP4 is therefore to ensure timely and urgent planning processes without compromising the time needed for deliberative democratic processes and conflict management. In this context, we perceive the GTA with its definitive goals, new support schemes and rapid timeline for common action, as an enabling structural context and momentum from which we can experiment with new collaborative planning models and tools based on co-creation processes with local stakeholders in the different LL's.

The specific objectives of WP4 are:

- To design and test planning processes that produce prioritized, geographically targeted land use transformation plans aligned with national objectives on climate change, aquatic pollution, and biodiversity. This will involve close collaboration with municipalities and LGT partners in WSs in which priorities and policy instruments will be discussed and decided.

- To design and test collaborative planning approaches resulting in an implementation strategy aligning with the land use transformation plan's goals while also addressing local needs and interests. This will involve local-level WSs with landowners, citizens, municipal representatives, and other LGT partners. Context permitting, specialized WSs may also be organized for landowners to encourage their participation in land use change projects
- To evaluate various collaborative planning approaches and their results. This will include an evaluation of the tested planning approaches in the LLs as well as evaluations of other ongoing or finalized collaborative planning initiatives outside the LLs

OVERALL APPROACHES

WP4 adopts an action research approach and draws on theories from the academic field of collaborative planning and deliberative democracy[1] (Forester, 2009 & Mansbridge et al., 2006). This means that we, as researchers, work collaboratively together with diverse stakeholders, such as planners, farmers, nature organizations, recreative users and local museums, in the different LL's, to: (1) co-create process designs and understandings of the landscapes and transformation challenges, (2) co-create transformation plans and implementation strategies (3) engage in critical reflections and evaluations of the processes and the outcomes.

Through mapping of interests and ethnographic case studies, the WP will begin with co-creating an understanding of the socio-ecological contexts of the LLs (Task 4.1.). With a point of departure in this understanding, and analyses from WP3, we design and initiate co-creating processes with relevant actors identified through the mapping process (Task 4.2.). The co-creating processes consists of diverse WSs (to be held locally) that enable diverse stakeholders to participate in decision-making and to foster multi-stakeholder dialogues, debates and negotiations (Forester, 2009). For the development of implementation strategies, a broad spectrum of local stakeholders will be invited to ensure the inclusion of diverse perspectives and enable solutions tailored to the local contexts (Task 4.2.2.), while the development of the transformation plan will involve the municipalities and other representatives for the LGT are the core partners (Task 4.2.1.). The engagement in critical reflections and evaluations will be done through the application of apply a formative evaluation approach (Task 4.3.). A formative evaluation is a type of assessment conducted during the implementation phase to identify strengths, weaknesses, and opportunities for improvement, with the aim of refining processes and enhancing outcomes (Fischer et al., 2011).

1 Participation, collaboration, and deliberation are concepts linked often to communicative planning research (e.g. Forester, 1999; Healey, 1997; Innes and Booher, 1999), which highlights Habermasian democratic deliberation, with its focus on consensus, reasoned debate and communicative rationality (Inch, 2015; Legacy, 2017). In this WP, however, we adopt a broader concept of participation, incorporating collaborative planning within the framework of recent deliberative theories, which emphasize pluralism, open-ended dialogues, and mutual learning (e.g., Forester, 2009; Mansbridge et al., 2006)

RESEARCH METHODOLOGY AND ACTIVITIES

To address the objectives, the research of WP4 is divided into three tasks: 1) Understanding and interpreting the context, 2) Designing the transformation plan and the framework for implementation and 3) Evaluating collaborative planning and governance.

TASK 4.1 UNDERSTANDING AND INTERPRETING THE CONTEXT (M2-M7)

This task includes an analysis of the GTA and its implication for the local landscapes in the LLs. The analysis will identify potential challenges related to planning scale, organization, participation, leadership, coordination and existing land uses. Further, the task includes an examination of the LL landscapes to understand issues specific to the local context e.g., land use conflicts, conflicts between public authorities and private actors, landowners' preferences and wishes for the future, and goals expressed in municipal plans. The analyses will employ map and document analysis (Maps and data from ArealInfo, municipality plans etc.), walks, interviews/focus-group interview and questionnaire surveys targeting landowners, public authorities and other stakeholders and will inform the design of the subsequent collaborative processes described in Task 4.2. Part of this work takes place in WS4 (Figure 6).

TASK 4.2. DESIGNING THE TRANSFORMATION PLAN AND THE FRAMEWORK FOR IMPLEMENTATION

TASK 4.2.1 DESIGNING THE TRANSFORMATION PLAN (M5-M9)

This step includes identifying transformation areas, based on input from WP2 and setting overall goals, and listing potential implementation measures in collaboration with relevant stakeholders/actors based on information from Task 4.1. This will be done in WSs in each LLs (WS5-7, Figure 6). The relevant stakeholders are the LGT (the municipalities, local nature concertation – and agricultural organization), the watershed consultants, public agencies and possible other stakeholders (identified in task 4.1)

TASK 4.2.2: DESIGNING THE IMPLEMENTATION STRATEGY (M7-M20)

The purpose of this task is to design and organize WS5-7 (Figure 6) aimed at mobilizing interest in land-use transformations, clarifying relevant implementation measures and barriers, and to produce a strategy for the implementation of the transformation plan. This task will result in a local implementation plan to guide the needed land-use changes including goals and prioritized measures and actions. Additionally, the WSs will produce multi-stakeholder inspired visualizations and stories of sustainable future landscapes to accelerate and inspire the implementation of GTA. Key stakeholders in the WSs include landowners, citizens, community representatives, NGOs, watershed consultants, and representatives from relevant public authorities within the LLs. Various WSs will be held depending on the conflict level and the complexity of the needed land use changes.

TASK 4.3 EVALUATING COLLABORATIVE PLANNING AND GOVERNANCE

TASK 4.3.1 EVALUATION OF MUNICIPAL AND LGT COORDINATION IN THE LLS (M20-M28).

Based on the planning processes applied in Task 4.2 and their outputs, a formative evaluation will be carried out. The evaluation will focus on (1) assessing the effectiveness of municipalities in their role as local coordinators and facilitators in the implementation of the GTA including an evaluation on the processes, results (the proposed land use changes) and stakeholder engagement, (2) identifying challenges and opportunities in the coordination between local and national levels, and (3) identifying gaps in implementation measures by means of focus group interviews, document analysis and observations. The results of the evaluation will be discussed in a final WS.

TASK 4.3.2 EVALUATION OF PAST AND ONGOING COLLABORATIVE EFFORTS (M2-M30)

This task will focus on formative evaluation of past and on-going experiences related to the implementation of various collaborative efforts (both formal and informal) of relevance to the GTA. The evaluation will assess on-going and historical governance frameworks, particularly in the context of coastal water councils, stream and drainage associations, and engagement processes within municipalities and LGT outside the LL. The evaluation will examine how these frameworks have supported democratic and effective land-use planning and implementation, identifying challenges and opportunities for improvement. The evaluation will employ document analysis, interviews, and WSs to gather insights from stakeholders

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES

WP4 will be dependent on the fast-track results and the scenarios from WP2 to identify areas for transformation and set overall development goals. WP4 and WP3 are mutually dependent in the exchange of information on legal opportunities and barriers in the LL, need for subsidy schemes and other measures as well as conflicts related to existing measures. WP4 will coordinate and collaborate with WP5 on LL activities, in particular WS5-7 and 8-9, Figure 6) and the plans and implementation strategies produced in WP4 will inform the elaboration of farm business model in WP5. WP4 will deliver critical input to the scenarios that are evaluated in WP6. The landscape narratives developed in WP3 and WP4 from different angles will be closely coordinated.

DELIVERABLES

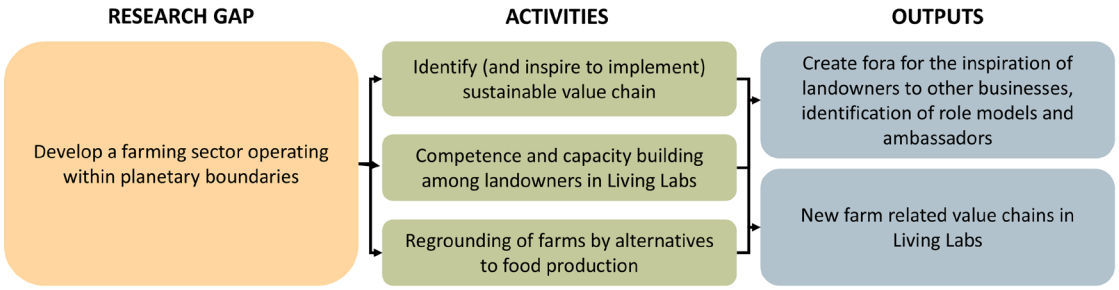
- D4.1 Ongoing communication with Science-Policy Forum through 'knowledge notes' (written/oral) (M6, M9, M12, M18, M24) on the implementation of the GTA in the LL and the evaluation of various collaborative efforts. If agreed on with Science-Policy Forum 'knowledge notes' may be published on relevant ministerial websites etc. This deliverable will be coordinated with WP7
- D4.2 Internal reports: Exploring the landscapes of the LL(M7)
- D4.3 Short report with examples of transformations plans and local implementation plans for the green transition (M12).
- D4.4 Preliminary guidance and policy recommendations on: Delivering effective and coordinated implementations of the GTA with a focus on the themes: actors, collaboration, conflicts management, coordination, communication, and distribution of responsibilities. The target groups are municipalities and national authorities (M14)
- D4.5 Concept note on tools, methods and processes for collaborative planning and implementation for the green transition (M18).
- D4.6 Short report of best practices for collaborative planning and implementation of the green transition (M30)

4.6
WP5: FUTURE FARMS

Lead: Irene Wiborg

Co-lead: Ivan Damgaard, Anna Worm

Partners: SEGES INNOVATION, Fjordland, AU-AGRO, KU-ING, KU-VET



OBJECTIVES

The overall objective for WP5 is to inspire and support the farmers and the connected value chains in adapting to the environmental conditions required by the transformed landscapes as result of the GTA. This WP aims to develop, test and showcase sustainable farming solutions across various landscapes to address societal needs. These efforts will include analyzing and optimizing sustainable value chains through collaborative efforts within LLs – real world environments designed to foster innovation and facilitate practical testing.

The specific objectives are to:

- identify, evaluate, and optimize sustainable existing value chains in the LLs by engaging with farmers, businesses, and research institutions, to pinpoint promising opportunities
- collect and share knowledge about innovative solutions and best practices aiming to inspire and empower local stakeholders for new business opportunities including new business alternatives in sectors like health and tourism
- identify new business opportunities in the LLs in close collaboration with actors in the entire value chain
- test of promising business opportunities in real-world environments of the LLs.
- formulate a business development framework enriched with the latest insights from sustainable business model design approaches and TRANSFORM learnings

OVERALL APPROACHES

WP5 is guided by the concept of Shared Value Creation (Porter and Kramer, 2011), which focuses on generating economic benefits that simultaneously provide positive societal and environmental impacts. The goal is to display how sustainable practices can contribute to broader societal benefits, all within the framework of staying inside planetary boundaries. To support this objective, WP5 utilizes business model tools like the Business Canvas Model and Sustainable Business Model Design (Lüdeke-Freund et al., 2024). This approach helps landowners and businesses explore innovative solutions, from identifying untapped market opportunities to optimizing existing practices for better environmental and economic performance. The working process of the WP will further be supported by co-creation methodologies, sustainability assessment frameworks, in-depth study tours, both locally and abroad and pilot testing of within the LLs to evaluate potential solutions, refine strategies, and scale up effective approaches.

TASK 5.1 IDENTIFY EXISTING AND POSSIBLE SUSTAINABLE VALUE CHAINS IN LLS (M1-M10)

This task aims to identify existing and possible sustainable value chains and business opportunities within the LLs that not only meet market demand but also respect ecosystem dependencies and align with sustainability objectives. The WP will identify new business opportunities by getting inspiration and learnings from related sectors such as forestry, fishery and energy with a special focus on side stream upcycling from other parts of the country or abroad. Identified value chains will be evaluated utilizing the EEIV's (Essential Environmental Impact Variables), a set of standardized environmental metrics developed to measure corporate impacts within planetary boundaries. The SAFA (Sustainability Assessment of Food and Agriculture Systems) Guidelines will complement the EEIV approach by providing a holistic assessment framework that includes social well-being, economic resilience, environmental integrity, and good governance.

TASK 5.2 IDENTIFYING NEW BUSINESS CASES AMONGST LANDOWNERS IN CLOSE COOPERATION WITH THE VALUE CHAIN (M7-M20)

Through WS4, 8 and 9 (Figure 6), co-creation, and stakeholder engagement in the LLs, we aim to initiate sustainable value chains with an understanding of relationships, collaboration, and shared value creation. This includes focus on various challenges in establishing new value chains, identification of the long-term economic benefits for sustainable solutions, the need for education and technological support and the potential of small, successful changes that demonstrate potential. Input from first draft results from WP1 and WP2, inspiration gathered in Task 5.1 and relevant experts will set the scene and qualify perspectives on the local challenges in the LLs.

TASK 5.3 DEVELOP SUSTAINABLE BUSINESS CASES (M15-M24)

The aim of this task is to develop scenarios for alternative business cases in the LLs. This includes gathering information about the landscape, including its ecological, cultural, and economic value, with inputs from WP1 and WP2 and supplemented with local knowledge. We will organize brainstorming sessions on, for example, health and tourism options with diverse participants, to generate novel creative ideas. Finally, the scenarios will be validated by key actors to gauge interest and practicality.

TASK 5.4 FRAMEWORK FOR BUSINESS DEVELOPMENT (M23-M30)

With inspiration from the above tasks this task aims to develop a framework for business development that landowners and advisors can use for analyzing both well-established, alternative, and upcoming business models and value chains. In the LLs, we will test the capacity of the model to identify the market demand and the potential for capacity and scale within the alternative and upcoming business models and value chains so that the landowners are presented for an implementable transformation. We will also facilitate clusters across the LLs and integrate with existing stakeholders and business partners so the path from lab to reality can be minimized.

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES

WP5 will draw on information from WP1 and WP2 on the local conditions in the LLs in relation to future farm options. Further, the WP5 farm business models will be integrated into different land use solutions formulated in WP1. WP5 will coordinate and collaborate with WP4 on LL activities, in particular during the activities in WS5-7 and 8-9. WP5 will further be informed on the elaboration of farm business models from work with stakeholders in WP4. WP5 further relies on inputs from WP3 in terms of regulatory barriers and opportunities pertaining to the farming sector.

DELIVERABLES

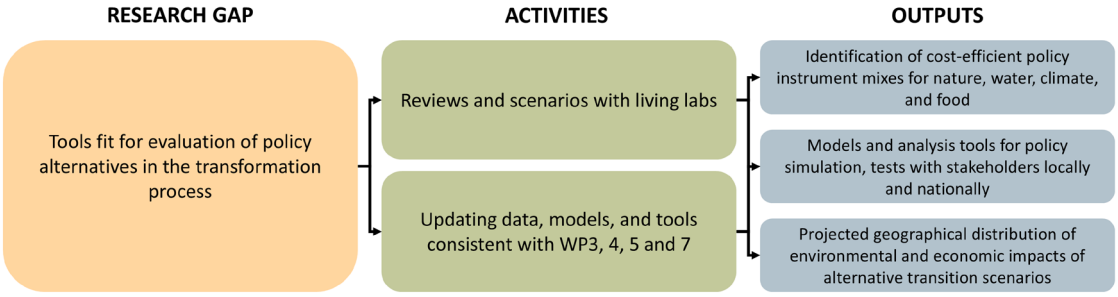
- D5.1: Mapping and sustainability assessment of existing value chains in the LLs (M6)
- D5.2: Roadmaps for specific new business opportunities for inspiration in the LLs (M8)
- D5.3: Inspirational report on alternative business cases in different landscapes (M18)
- D5.4: Scenarios for sustainable value chains in the LLs (M24)
- D5.5: Framework for business development for landowners and advisors (M30)

4.7
WP6: EVALUATION OF POLICY INSTRUMENTS

Lead: Mette Termansen

Co-lead: Berit Hasler

Partners: KU-IFRO, KU-IGN, AU-AGRO, AU-BIO



OBJECTIVES

The overall objective of WP6 is to guide policy design on the choice of instruments to achieve a transformation of agricultural landscapes through an environmental economic evaluation. New design formats for environmental and climate policies for agricultural land are needed, to incentivize pro-environmental behavior and ensure compliance with the environmental carrying capacity and the planetary boundaries. Agri-environmental policy in Denmark has largely relied on voluntary mechanisms regulated under the EU Common Agricultural Policy (the CAP). For decades, the CAP has compensated farmers for the costs incurred for implementation of measures to reduce environmental pollution and improve environmental services. However, the CAP mechanism has been criticized for not meeting the intended objectives. One possible explanation is that the schemes have not taken spatial heterogeneity into account in scheme design - hampering cost-effectiveness (Hasler et al., 2022), another reason is that the programs have lacked efficient mechanisms to ensure compliance with local environmental carrying capacities. Furthermore, policy options are usually analyzed in isolation. In WP8, we develop a spatially specific policy evaluation tool to allow evaluation of the economic and environmental impact of policy mixes. We envisage to select a number of policy instruments for in depth analysis (e.g. uniform regulation of environmental emissions, environmental taxes, action-based and result-based agri-environmental subsidy schemes, designs of collective subsidy schemes, spatial zoning with differentiated payments and transferable quotas for bundled environmental services). The aim is to provide a cost-effectiveness analysis of the alternative policy options to meet policy goals for public good provision. The policy tools will be tested at the scale of the LLs as well as at the national scale. This analysis is crucial to enable agri-environmental and climate policies to incentivize transformation of agricultural landscapes.

The specific objectives are to:

- update the data layers used in TargetEcon with the latest evidence on the potential of different measures, their effectiveness and cost of implementation. Specifically, this includes updating the climate mitigating potential, the reduction in downstream nitrogen and phosphorous emissions to marine waters and lakes, biodiversity conservation potential and recreational benefits.
- prepare TargetEcon scenario simulations for local catchments and refine simulations based on specific interests of stakeholders in the Living Labs
- synthesize the different sources of evidence with the view to include behavioral barriers and levers into land use transformation scenarios
- adjust the TargetEcon model to conduct policy simulations for selected relevant instruments for the Green Tripartite Agreement.

RESEARCH METHODOLOGY AND ACTIVITIES

By integrating high spatial resolution environmental-economic data and behavioral models of land-use choices the effectiveness of different policy designs to meet local and national environmental constraints will be simulated (as demonstrated in Bartosz et al., 2021). An existing model system, TargetEcon, will be used as a starting point to represent drivers of adoption of environmental and climate measures under a given incentive mechanism. TargetEcon is a national scale economic model minimizing costs of achieving national and sub-national policy targets on landscape scale, on nutrient emissions to fresh and marine waterbodies, climate change mitigation and biodiversity conservation (Termansen et al., 2023). We develop the model further to be able to construct farm-level responses to economic instruments and incentives. This will allow us to simulate how farmers with different economic productivity and different opportunities to contribute to environmental, climate and biodiversity targets are likely to react if different policy instruments are implemented. TargetEcon model concepts are described in appendix f. The appendix also outlines how the model is being developed and applied in current research and advisory projects and the main developments in the project.

The work in TRANSFORM is divided into four tasks outlined below.

TASK 6.1: REVISING AND DEVELOPING TARGETECON (M1-M6)

This task will update the data layers used in TargetEcon to represent the latest scientific evidence on the potential of different measures, their effectiveness and cost of implementation. The updating will utilize the spatial data layers provided by WP3 (IT-tools for land transformation in the green transition) and WP4 (Spatial land use assessment) and will continue during the TRANSFORM project when feasible as new data become available. This new version will focus on the agricultural landscapes and represent the farms as the decision-making unit.

TASK 6.2: TESTING TARGETECON SCENARIOS IN THE LLS (M6-M24)

The task will prepare illustrations and visualizations of TargetEcon scenario simulations for the local catchments. We will refine simulations based on specific interests of stakeholders in the LLs. As the stakeholders in the LLs have different visions for environmental, climate biodiversity conservation and outdoor recreation we seek to tailor the simulations to the local context and provide estimates of the cost of implementation. The work will include participation in at least two WSs in each of the LLs (WS10-11), to iterate between presentations, proposals from participants and new results from TargetEcon policy simulations.

TASK 6.3: TESTING TARGETECON BEHAVIORAL ASSUMPTIONS AGAINST EMPIRICAL EVIDENCE (M6-M20)

The implicit assumption in TargetEcon is that landowners enroll land in environmental programs if their income forgone and costs incurred are compensated by the implementing authority. While this assumption can explain a large part of the observed participation in agri-environmental programs, it cannot adequately explain the differences in the interest in and effectiveness of different programs. In this task, we synthesize the different sources of evidence with the view to include behavioral barriers and levers into land use transformation scenarios. This will be achieved by scrutiny of existing datasets from uptake of existing agri-environmental programs and data sets from experimental tests of alternative policy mechanisms relying on behavioral economics techniques. We will also conduct a new survey aimed at eliciting farmers' preferences for alternative instruments under consideration in the green agreement. The survey will be piloted in the LLs.

TASK 6.4: SIMULATION OF POLICY INSTRUMENTS (M16-M28)

Utilizing the TargetEcon model (Task M8.1) and based on inputs from the LLs and Task 8.3 we will adjust the TargetEcon model to conduct simulations for selected relevant policy instruments for the green agreement. We will evaluate the their cost-effectiveness measures by the environmental effect relative to the costs to the farmers and agency implementing the policy instruments. The final selection of instruments will be based on local and national stakeholder interests explored in the LLs as well as on scientific significance and novelty. We aim to use the evidence gathered in Task 8.3 to update the TargetEcon model and analyze the significance of the added behavioral barriers and levers compared to a model result based on only income foregone and direct costs.

KEY INTERLINKAGES AND FEEDBACK BETWEEN ACTIVITIES:

WP6 has strong linkages with the other WPs, in particular WP3 as regards the development of new tools and regulatory instruments for land transformation, with WP1 and WP2 in terms of the necessary data and scenario inputs and with WP4 when the policy evaluation is performed in the LLs WSs.

DELIVERABLES

- D6.1. Policy brief based on results from LLs testing (M24)
- D6.2: Documentation of Inclusion of behavioral drivers in spatially explicit environmental-economic evaluation (M24)
- D6.3: Simulation results: Policy support through using environmental-economics models (M30)

4.8
WP7 OUTREACH AND SYNTHESIS

Lead: Irene Wiborg

Co-leads: Henrik Vejre, Tommy Dalgaard.

Partners: SEGES Innovation, KU-IGN, AU-AGRO

The results of TRANSFORM need to be communicated with dispatch and accuracy to targeted audiences in order to reach the expected impact. This is the dedicated task of WP7.

OBJECTIVES

The overall objective of this WP is to organize and implement external communication and outreach efforts, ensuring knowledge sharing and communication from the consortium and engagement with relevant stakeholders. WP7 will establish and maintain stakeholder boards involving key external stakeholders, to ensure science-based policy advice in relation to the implementation of the Green Tripartite Agreement. WP7 is based on a thorough stakeholder mapping, which ensures the involvement of the most important stakeholders, including, e.g., municipal and national authorities and decision makers, academia, land use related business associations, NGOs, think tanks and funding bodies. WP7 will safeguard outreach with scientific, policy- and practice-oriented knowledge.

The specific objectives are to:

- raise awareness of project outputs through its distinctive and recognizable project branding
- exploit, disseminate and transfer results, which will help maximize the uptake and implementation of project results by all stakeholders
- perform outreach activities to engage with designated stakeholders, and the public at large
- establish knowledge exchange and synergies with other relevant initiatives and research infrastructures that address land use issues
- promote open access to and re-use of research data generated by TRANSFORM

The responsibilities of WP7 will be solved in the following tasks

TASK 7.1 COMMUNICATION AND OUTREACH STRATEGY AND PLAN (M1–30)

This task formulates an overall communication and outreach plan which acts as guiding principles for all communication from the project. The communication plan is an agile document with ongoing adjustments, with the focus to reach the greatest possible impact. Further this task performs stakeholder mapping to ensure that all relevant stakeholders are considered in the outreach plan. Stakeholder management will be integrated in the communication and outreach plan.

TASK 7.2 COMMUNICATION PLATFORMS (M1-30)

This task establishes access to a project website, www.tranzform.dk, which serves

external communication purposes. Further, the task maintains a LinkedIn profile. Outputs such as policy briefs, articles, podcasts, and videos will be secured regularly. The task decides and prioritizes among the numerous communication options, i.e. webpage, social media, podcasts, webinars, targeted articles, papers, fact sheets, etc.

Further, the task ensures that the project is visible at relevant events pertaining to the public debate within the policy realms of agriculture, biodiversity, environmental issues, climate, landscape, and rural development. The task arranges the participation in the public policy festivals such as Folkemødet, Klimamødet, and Naturmødet, and in regular conferences such as Plantekongressen, Åben Land konferencen, KTC annual conference; Vand Og Natur annual conference. This task arranges public meetings with other relevant actors in the science-policy realm, ensuring broad communication. The task arranges meetings, symposia and conferences which ensures swift communication of results and progress to relevant fora, both locally and nationally, particularly local Tripartite organizations, and business organizations.

TASK 7.3 STAKEHOLDER OUTREACH (M1-30)

This task arranges and leads meetings in the fora critical for communication with key stakeholders. The task establishes and maintains two stakeholder boards: Science-Policy Board (SPB) and Stakeholder Board (SB).

In the SPB, the project involves stakeholders representing key actors in the Green Tripartite Agreement, for mutual exchange of ideas and reflection on the projects development on the one hand and on the development in the policy realms on the other. The SPB inspires and guides activities and progress in the project, provides policy input from the organizations represented. The confirmed participants comprise Ministeriet for Grøn Trepart, Kommunernes Landsforening, Dansk Industri, Danmarks Naturfredningsforening, Landbrug og Fødevarer and Concito. SPB meets four times annually. The topics for meetings comprise the overall project results, the synchronization of the project activities with the Green Tripartite implementation, changes in policy needs and possible implications for the project.

In the SB the project consortium involves stakeholders from a variety of groups in society. It is a particular goal to ensure representation from groups otherwise poorly represented in policy processes. The board reflects and comments on the project development and provides policy input from the organizations represented in the board). The composition of the board will be decided based on the stakeholder mapping, but will encompass NGOs, Land related trusts and funds, . SB meets twice annually. The topics for meetings comprise the overall project results, changes in policy needs and possible implications for the project.

DELIVERABLES

- D7.1 Website launched (M1)
- D7.2 Stakeholder map (M1)
- D7.3 Communication and outreach strategy formulated (M2)
- D7.4 Plan for engagement of the Science-Policy Board(M2)
- D7.5 Detailed communication and outreach plan based on the communication and outreach strategy formulated. (M3)
- D7.6 Podcast format launched (M4)
- D7.7 Plan for the composition and engagement of the Stakeholder Board (M)

5 TIMELINE AND MILESTONES

The project is planned to be executed from May 2025 to the end of 2027, 32 months in total. The timeline is synchronized with the expected implementation of the GTA, which is due by the end 2027 according to the political agreement. Deliverables and Milestones are adapted to this implementation process. The GTA implementation process is strongly dependent on political processes and administrative capacities in public authorities, hence factors outside the project. This is also considered in the Risk Assessment.

		2025								2026												2027											
	Month	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	Project month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
WP0	0.1 Internal coordination	D0.1	M01	M0.2			D0.5/ M0.2			M0.2			M0.2		D0.6	M0.2			M0.2			M0.2			M0.2			M0.2				M0.2	D0.7
WP0	0.2 Project quality management				D0.4	M0.3																											
WP0	0.3 Living Labs coordination			M0.4			D0.2																										
WP0	0.4 Scientific Advisory Board				D0.3	M0.5																											
WP1	1.1 Data Identification		M1.1				M1.2												D1.1														
WP1	1.2 Decision Support tool		M1.3				M1.4												M1.5										D1.2				
WP1	1.3 Digital Map of Denmark				M1.6										M1.7												D1.3					
WP2	2.1 Fast track assessments	M2.1			M2.2	D2.1																				D2.2							
WP2	2.3 Future Scearios																	M2.4							M2.5				D2.3				
WP2	2.4 Guidelines for downscaling																	M2.3							M2.3						D2.4		
WP3	3.1 Legal Framework/land ownership models									M3.1			M3.2		M3.3		D3.2	M3.4	D3.1										D3.2				
WP3	3.2 Land use histories							M3.5	D3.3				M3.6	D3.3	M3.7	D3.4								M3.8	D3.4								
WP4	4.1 Planning Context		M4.1					D4.2																									
WP4	4.2 Designing Transformation Plans									M4.2			D4.3		D4.4																		
WP4	4.3 Evaluation of Planning and Governance																M4.3		D4.5												D4.6		
WP4	4.1 - 4.3						D4.1			D4.1			D4.1						D4.1						D4.1				M4.4		M4.5		
WP5	5.1 Value chains		M5.1				D5.1		D5.2																								
WP5	5.2 Identification of New Business cases												M5.1						D5.3														
WP5	5.3 Develop new businesses																								D5.4								
WP5	5.4 Framework for business development																										M5.3				D5.5		
WP6	6.1 Revision of TargetEcon						M6.1																										
WP6	6.2 Testing TargetEcon in Living Labs										M6.2										M6.3				D6.1								
WP6	6.3 Testing TargetEcon assumptions																				M6.4				D6.2								
WP6	6.4 Simulation of policy instruments																														D6.3		
WP7	7.1.Communication plan	D7.3		D7.5																													
WP7	7.2 Communication platforms	D7.1			D7.6																												
WP7	7.3 Outreach	D7.2	M7.3	M7.1	M7.2		M7.6							M7.3	M7.1	M7.5	M7.2		M7.6							M7.3	M7.1		M7.2		M7.6		
WP7	- Science-Policy Board	M7.7		D7.4	M7.8		M7.8				M7.8				M7.8				M7.8			M7.8			M7.8			M7.8					
WP7	- Stakeholder Board	M7.9		D7.7			M7.10			M7.10			M7.10			M7.10			M7.10			M7.10			M7.10								
	Project month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

MILESTONES

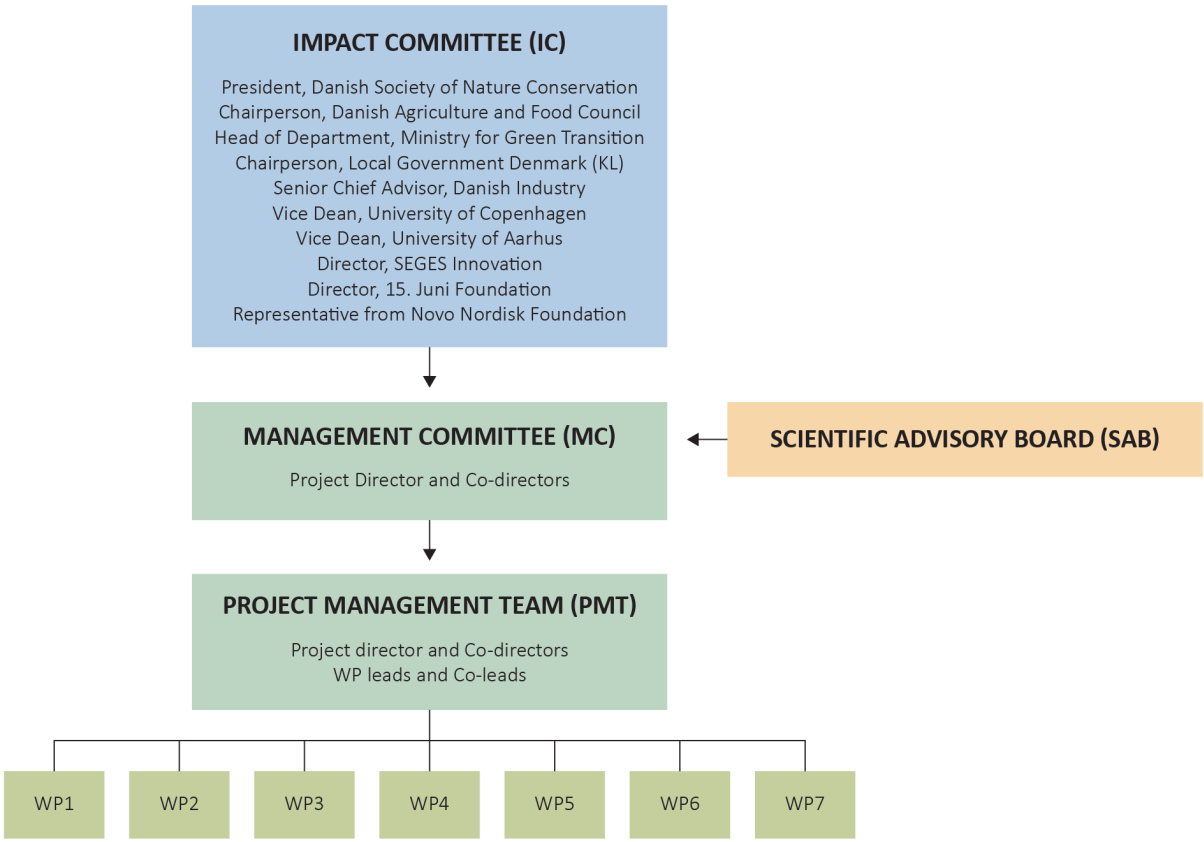
- M0.1 Project Kick off meeting (M2)
- M0.2 Regular TRANSFORM consortium meetings (M3, M6, M9, M12, M15, M18, M21, M24, M27, M31)
- M0.3 Publication Agreement (M5)
- M0.4 MoU Living Labs (M3)
- M0.5 Establishment of SAB (M5)
- M1.1: Draft data, tool(s), and user interface architecture (M2)
- M1.2: First version of data viewer and data access tool on landscape data (M6)
- M1.3: List of user needs for landscape tool(s) (M2)
- M1.4: First prototype of decision support tool(s) for landscape transformations (M6)
- M1.5: Second prototype of decision support tool(s) for landscape transformations (M18)
- M1.6: First version of novel landscape map for Living Labs (M4)
- M1.7: First version of pre-validated landscape map for entire Denmark (M14)
- M2.1: Overview of science-based guiding principles, data and geospatial framework for fast-track prioritisation and land use assessments regarding nature/biodiversity (water/environment, climate/carbon, and agriculture/production (M1)
- M2.2: Trial geospatial prioritisation, land use assessment, downscaled for tested with Living Labs (M4)
- M2.3: Revision of the fast-track prioritisation, land use assessments and further examples of downscaled planetary boundaries for testing in living Labs based on improvised geospatial datasets and downscaling (M17, M24)
- M2.4: Trial scenarios for future land use assuming compliance with land-use related targets tested with Living Labs (M17)
- M2.5: Revised scenarios for future land use assuming compliance with land-use related targets tested with Living Labs (M24)
- M3.1 Overview of legal framework and planning tools (M9)
- M3.2 Fact-finding workshop (M12)
- M3.3 Overview regarding landownership models (M11)
- M3.4. Fact-finding workshop (M14)
- M3.5 Overview of archival and historical source material from testbed municipalities (M7)
- M3.6 End of first leg of ethnographic fieldwork in testbed municipalities (M12)
- M3.7 Overrview of critical links between historical and current land use dilemmas (M14)
- M3.8 End of second leg of ethnographic fieldwork in testbed municipalities (M23)
- M4.1 Start-up meetings with municipalities and Local Green Tripartite (M2)
- M4.2 Transition plan design finalized (M9)
- M4.3 Local implementation framework finalized (M16)

- M4.4 Workshop on the evaluation of the planning processes in the Living Labs (M28)
- M4.5 Final policy evaluation ready (M30)
- M5.1: Relevant value chain actors in the Living Labs identified (M2)
- M5.2: Relevant national and international business cases identified (M4)
- M5.3.: Cross Living Lab knowledge exchange (M26)
- M6.1. Documentation of TargetEcon2.0 (M6).
- M6.2. Internal report on the testing of TargetEcon scenarios in the Living Labs (M10)
- M6.3. Internal report on the testing of TargetEcon scenarios in the Living Labs (M20)
- M6.4. Internal report documenting the empirical evidence on behavioural assumptions from existing data sets (M20)
- M7.1 Regular participation in the Folkemøde (M3, M14, M26)
- M7.2 Regular participation in the Klimamødet (M4, M16, M28)
- M7.3 Regular participation in the Naturmødet (M2, M13, M25)
- M7.4 Participation in relevant conference – Open Agriculture, Association of Technical Directors in Danish Local Authorities, Crop Congress etc. (M1-30)
- M7.5 TRANSFORM event in the Parliament (M15)
- M7.6 TRANSFORM events in the Living Labs (M6, M18, M30)
- M7.7 Science Policy Forum established (M1)
- M7.8 Regular Science-Policy Board meetings (M4, M6, M10, M14, M18, M21, M24, M 27)
- M7.9 Stakeholder Board established (M1)
- M7.10 Regular stakeholder Board meetings (M3, M6, M9, M12, M 15, M18, M21, M24)

6 GOVERNANCE AND ORGANIZATION

6.1 GOVERNANCE

TRANSFORM will be governed by a Management Committee (MC), which consists of the Project Director (PD) from University of Copenhagen, the two Co-Directors (CDs) from SEGES Innovation and Aarhus University, and the Project Administrator (PA) from University of Copenhagen. The MC will operate under the auspices of an Impact Committee (IC) with the overall aim of ensuring the impact of the initiative. The IC will consist of heads of the key partners of the GTA and heads of the leading research and innovation institutions of the consortium. The MC is responsible for implementing the project and inter alia engaging with the IC, the SAB, the SPB and the SB in accordance with the principles set out below. The MC is supported by a Project Management Team (PMT), which consists of WPL and WPCL. The governance structure is illustrated in Figure 7.



6.1.1 IMPACT COMMITTEE (IC)

The purpose of the IC is to ensure expected impact and thus be an integrated space for knowledge exchange and engagement at highest level to ensure the expected impact is reached. The IC is a critical component in fostering collaboration with key stakeholders and guiding the project towards achieving its objectives.

The PD is responsible for arranging and executing the meetings supported by the PA. The IC shall meet a minimum of twice a year and whenever deemed necessary by the chairperson to address pertinent issues. The IC is composed of key stakeholders who have a direct influence on and interest in the project's impact. The IC will have representatives from the following 10 organisations:

1. Danish Society of Nature Conservation (suggested: Maria Reumert Gjerding, President)
2. Danish Agriculture and Food Council (suggested: Søren Søndergaard, Chairperson)
3. Ministry for Green Transition (suggested: Jacob Møller Nielsen, Head of Department)
4. Local Government Denmark, KL (suggested: Birgit S. Hansen, Chairperson)
5. Danish Industry (suggested: Morten Løber, Senior Chief Advisor)
6. University of Copenhagen (suggested: Lise Arleth, Vice Dean)
7. University of Aarhus (suggested: Ole Hertel, Vice Dean)
8. SEGES Innovation (suggested: Lisbeth Henricksen, Director)
9. 15. Juni Foundation (suggested: Henriette Christiansen, Director)
10. Representative from Novo Nordisk Foundation

The IC is tasked with the following responsibilities to ensure the successful execution and impact of the research project:

- advice on the strategic direction of the project in cases of external events which will compromise the planned project activities
- provide guidance and support decision making in case of critical changes in the societal framework
- act as external ambassadors in relation to the project ensuring the impact of the project on the implementation of the GTA
- identify synergies with other relevant projects

All members of the IC are required to maintain confidentiality regarding sensitive project information and adhere to any applicable legal and regulatory requirements subject to the grant recipients' internal processes.

6.1.2 MANAGEMENT COMMITTEE (MC)

The MC is the principal body responsible for the overall governance, strategic direction, and execution of the research project. The MC consists of the PD and the two CPDs, assisted by the PA. The MC operates in close coordination with the PMT to ensure seamless execution of project activities and adherence to strategic objectives.

The MC shall provide strategic leadership and oversight for the project, ensuring alignment with its objectives, timelines, and deliverables. Further, the MC shall provide daily executive leadership of the project. It coordinates with the PMT to implement the project efficiently and reviews and approves project decisions. The MC monitors the execution of project activities, oversees scientific progress, and ensures that milestones and deliverables are achieved within the stipulated timelines and budget constraints. MC ensures that the PMT and WP leads execute the project according to the plan. It serves as the primary point of contact for communication with stakeholders and is responsible for meeting all reporting requirements. The MC liaises with the IC, the SAB, the SPB, and the SB to integrate their insights into project planning and execution.

6.1.3 PROJECT MANAGEMENT TEAM (PMT)

The PMT is led by the PD and the co-PDs. The PMT includes the WPL and WPCL . The main responsibilities of the PMT are to coordinate the scientific activities of the project and between the WPs.

The main tasks of the PMCT are to

- coordinate activities and share knowledge across the WPs
- discuss and exchange knowledge about activities within each WP
- coordinate deliverables (timing, format, and quality) among the WPs

The PMT will meet monthly. Meetings will alternate between meetings with WP leads only, and meetings with all WPLs and WPCLs. If needed, the PMT can meet ad hoc. The PMT aims at consensus, but in cases of disagreements, the MC makes the final decision

6.1.4 SCIENTIFIC ADVISORY BOARD (SAB)

The SAB comprises internationally reputed scientists within the academic fields covered by TRANSFORM.

The task of the SAB is to follow the progress of the project closely and advise the MC in relation to scientific matters. This includes:

- participation in key meetings of the project partners
- having access to milestones and deliverables of the project

- participation in selected SPB meetings and seminars
- identifying opportunities for collaboration and outreach internationally
- delivering a yearly summary statement on the progress of the project
- being available for consultation on an ad-hoc basis

The SAB ensures that TRANSFORM is harvesting knowledge and practice experience from countries outside Denmark. The SAB will meet three times in the duration of the project.

NAME	TITLE	INSTITUTION	KEY COMPETENCES
Katrin Prager	Reader, Dr.	University of Aberdeen United Kingdom	Institutions and governance in landscape management. Citizen science and knowledge exchange
Veerle Van Eetvelde	Prof. Dr	University of Gent Belgium	Landscape ecology, landscape preference, historical geography, landscape and heritage management and planning.
Gerard Velthof (Confirmed)	Prof.Dr.Ir	Wageningen University Netherlands	Agriculture and environment, Ammonia, Manure policy, Manures, Nitrate leaching, Nutrient management, Greenhouse gases
Tobias Plieninger (Confirmed)	Prof. Dr.	Georg-August University Göttingen; University Kassel Germany	Sustainability science focused on social-ecological interface. Landscape change and transformation, ecosystem services.
Benjamin Burkhardt	Prof. Dr.	Leibniz University Hannover Germany	Functions of complex landscape systems under anthropogenic influences, land use and climate change and dynamics predictions.
Ingrid Sarlöw Herlin	Prof.	Swedish University of Agricultural Sciences Sweden	Holistic and multifunctional nature of landscape, landscape ecology, diversity of landscape values and functions in spatial planning.
Teresa Pinto-Correira	Prof.	University of Evora Portugal	Rural landscapes transformation: causes and consequences, management and planning instruments for rural landscapes
Jesper Brandt	Prof. Emeritus	Roskilde University Denmark	Landscape Ecology, land use system, multifunctionality of landscapes, management of nature parks.

6.2. ORGANIZATION

The operational structure of TRANSFORM is given in Figure 8. Below, the roles and responsibilities are described.

6.2.1 PROJECT DIRECTOR (PD) AND CO-DIRECTORS (CD)

The PD and the two CDs will be responsible for the day-to-day operation of the project. The PD and the CDs are responsible for successfully planning, executing, reaching the KPIs, for coordinating and integrating project activities, resources, and stakeholders to achieve the objectives. The PD is monitoring the overall progress and all reporting to the Novo Nordisk Foundation and 15. Juni Foundation, as well as interactions with the IC and the SAB. Some of the key responsibilities of the PD and CDs comprise:

- coordination among WPs to ensure that all project partners are aligned with the project objectives, scope, communication, deliverables, timelines, and potential risks
- organizing a kick-off event and regular meetings to ensure opportunities for all partners to meet regularly
- ensure internal communication regarding project plan, contact lists, reporting templates, project guidelines and required quality criteria
- managing the IC meetings including scheduling, inviting, and compiling material
- leading the PMT, ensuring that roles and responsibilities among WP leads are clearly defined. Motivating project partners, promote collaboration, and provide guidance and support for the WPs
- engaging stakeholders by building, and maintaining, effective communication channels and organizing regular meetings. Stakeholder management must ensure that the project is relevant for the external stakeholders
- establishing and managing the SAB
- monitoring the identified risks and ensuring execution of mitigation strategies. The PD and CDs identify additional potential risks and implements appropriate mitigation strategies
- ensuring annual reporting to the Novo Nordisk Foundation and 15. Juni Foundation, according to the grant agreement

The PD will be supported by other KU staff members on day-to-day administrative tasks, financial control, communication activities, quality assurance, and the organization of events and meetings.

6.2.2 WP LEADS (WPL) AND CO-LEADS (WPCL)

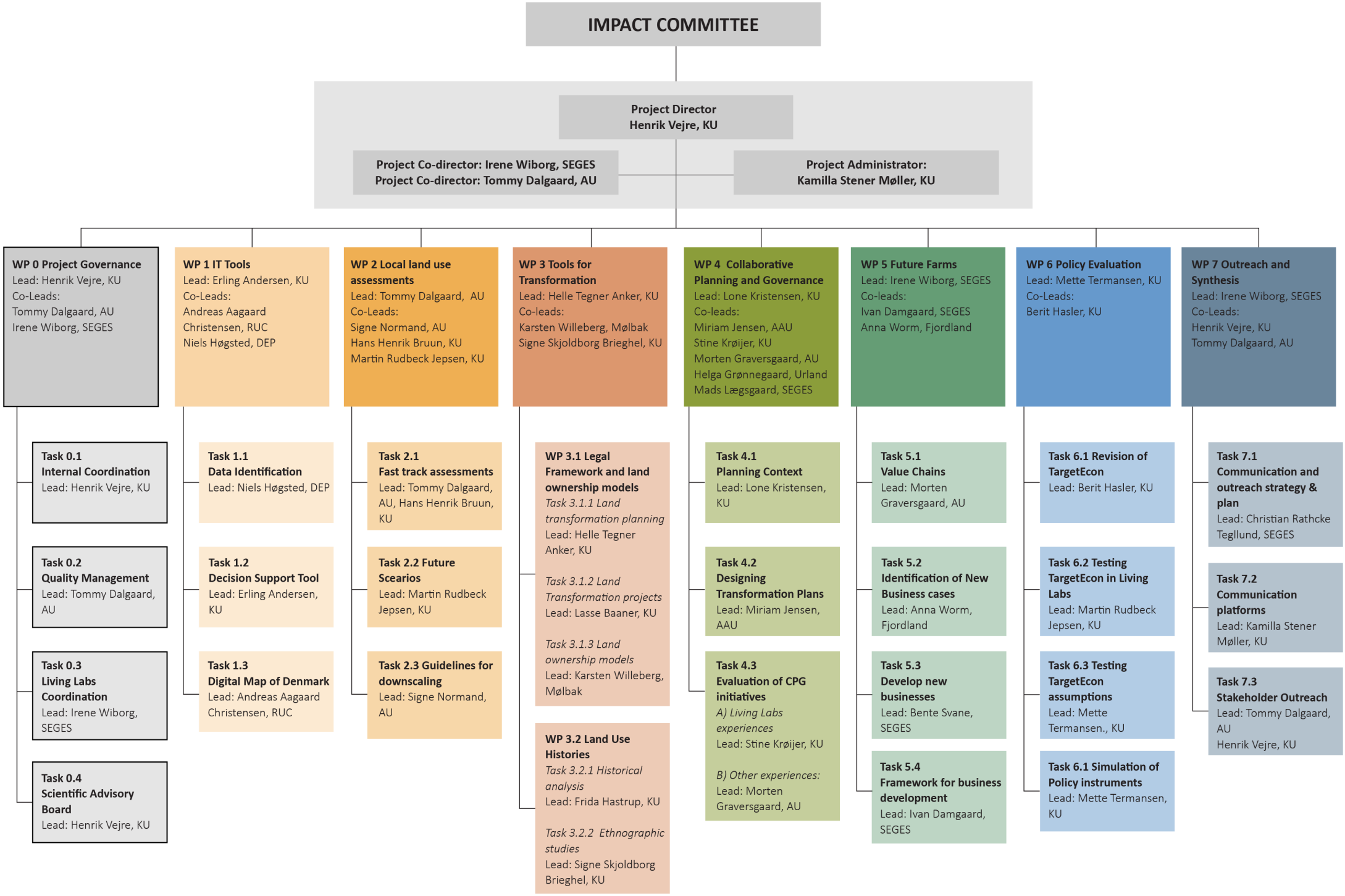
Each WP will be led by a WPL lead and at least one WPCL. The key responsibilities of the WPL and WPCL are:

- the overall management of the specific WP, including coordinating with the WP TL, setting timelines, and ensuring project milestones and deliverables are met
- collecting status updates from WP TLs and presents updates at the regular PMT meetings
- preparing input for regular reporting based on inputs from WP TL
- discussing and exchanging knowledge about activities within in each WP
- coordinating deliverables between the WPs
- preparation of material for regular evaluations of milestones and deliverables with input from the TLs to be presented to the IC
- promoting collaborations with other researchers, institutions, and stakeholders
- planning and running workshops and other outreach activities in collaboration with the PD and the CDs
- participating in coordination meetings with the other WPLs and WPCLs
- guiding the WPs scientific direction in collaboration with the SD and the SAB

6.2.3 WP TASK LEADS (TL)

Each of the 14 WP tasks is led by a TL. Some of the key responsibilities of the TLs are:

- planning and organizing the sub-activity, according to the defined tasks, milestones, and deliverables, including staffing positions, which must be approved by the PD
- assigning team members to the tasks and ensuring they have the necessary resources and support to complete their work.
- monitoring the progress of tasks, tracking task completion, and taking corrective actions as needed to keep the activities on track
- reporting progress, potential risks, and results to the WPLs to be included in the annual reporting towards the IC
- provide quarterly updates on WP status to the WPL


IMPACT COMMITTEE
Project Director
Henrik Vejre, KU
Project Co-director: Irene Wiborg, SEGES
Project Co-director: Tommy Dalgaard, AU
Project Administrator:
Kamilla Stener Møller, KU
WP 0 Project Governance
Lead: Henrik Vejre, KU
Co-Leads:
Tommy Dalgaard, AU
Irene Wiborg, SEGES
WP 1 IT Tools
Lead: Erling Andersen, KU
Co-Leads:
Andreas Aagaard Christensen, RUC
Niels Høgsted, DEP
WP 2 Local land use assessments
Lead: Tommy Dalgaard, AU
Co-Leads:
Signe Normand, AU
Hans Henrik Bruun, KU
Martin Rudbeck Jepsen, KU
WP 3 Tools for Transformation
Lead: Helle Tegner Anker, KU
Co-leads:
Karsten Willeberg, Mølbak
Signe Skjoldborg Brieghel, KU
WP 4 Collaborative Planning and Governance
Lead: Lone Kristensen, KU
Co-leads:
Miriam Jensen, AAU
Stine Krøijer, KU
Morten Graversgaard, AU
Helga Grønnegaard, Urland
Mads Lægsgaard, SEGES
WP 5 Future Farms
Lead: Irene Wiborg, SEGES
Co-leads:
Ivan Damgaard, SEGES
Anna Worm, Fjordland
WP 6 Policy Evaluation
Lead: Mette Termansen, KU
Co-Leads:
Berit Hasler, KU
WP 7 Outreach and Synthesis
Lead: Irene Wiborg, SEGES
Co-Leads:
Henrik Vejre, KU
Tommy Dalgaard, AU
Task 0.1 Internal Coordination
Lead: Henrik Vejre, KU
Task 0.2 Quality Management
Lead: Tommy Dalgaard, AU
Task 0.3 Living Labs Coordination
Lead: Irene Wiborg, SEGES
Task 0.4 Scientific Advisory Board
Lead: Henrik Vejre, KU
Task 1.1 Data Identification
Lead: Niels Høgsted, DEP
Task 1.2 Decision Support Tool
Lead: Erling Andersen, KU
Task 1.3 Digital Map of Denmark
Lead: Andreas Aagaard Christensen, RUC
Task 2.1 Fast track assessments
Lead: Tommy Dalgaard, AU, Hans Henrik Bruun, KU
Task 2.2 Future Scearios
Lead: Martin Rudbeck Jepsen, KU
Task 2.3 Guidelines for downscaling
Lead: Signe Normand, AU
WP 3.1 Legal Framework and land ownership models
Task 3.1.1 Land transformation planning
Lead: Helle Tegner Anker, KU
Task 3.1.2 Land Transformation projects
Lead: Lasse Baaner, KU
Task 3.1.3 Land ownership models
Lead: Karsten Willeberg, Mølbak
WP 3.2 Land Use Histories
Task 3.2.1 Historical analysis
Lead: Frida Hastrup, KU
Task 3.2.2 Ethnographic studies
Lead: Signe Skjoldborg Brieghel, KU
Task 4.1 Planning Context
Lead: Lone Kristensen, KU
Task 4.2 Designing Transformation Plans
Lead: Miriam Jensen, AAU
Task 4.3 Evaluation of CPG initiatives
A) Living Labs experiences
Lead: Stine Krøijer, KU
B) Other experiences:
Lead: Morten Graversgaard, AU
Task 5.1 Value Chains
Lead: Morten Graversgaard, AU
Task 5.2 Identification of New Business cases
Lead: Anna Worm, Fjordland
Task 5.3 Develop new businesses
Lead: Bente Svane, SEGES
Task 5.4 Framework for business development
Lead: Ivan Damgaard, SEGES
Task 6.1 Revision of TargetEcon
Lead: Berit Hasler, KU
Task 6.2 Testing TargetEcon in Living Labs
Lead: Martin Rudbeck Jepsen, KU
Task 6.3 Testing TargetEcon assumptions
Lead: Mette Termansen., KU
Task 6.1 Simulation of Policy instruments
Lead: Mette Termansen, KU
Task 7.1 Communication and outreach strategy & plan
Lead: Christian Rathcke Teglund, SEGES
Task 7.2 Communication platforms
Lead: Kamilla Stener Møller, KU
Task 7.3 Stakeholder Outreach
Lead: Tommy Dalgaard, AU
Henrik Vejre, KU

7 PARTNERS AND STAKEHOLDERS

PARTNER	MAIN CAPACITY	CONTRIBUTION TO TRANSFORM
FUNDED PARTNERS		
University of Copenhagen *KU-IGN* *Department of Geosciences and natural Resource management*	The Department provides research to help solve big societal challenges, such as the consequences of, and ways of adapting to climate change, ensuring the availability of clean drinking water; energy and raw materials; management advice on natural environments, landscapes and forests to secure biodiversity and ecosystem services. IGN work with several disciplines, including GIS and geoinformatics, collaborative planning and carbon balances. The Department engages in the project to contribute to and strengthen our position in research within the green transition of agricultural landscapes and rural areas	The key contributions from the project team comprise integrated planning in rural areas and agricultural landscapes. The team contributes with a strong multidisciplinary approach combing disciplines such as landscape ecology, spatial and collaborative planning, policy design and implementation, along with land system dynamics and carbon sequestration. Apart from the academic contributions, the Department contributes with the overall leadership of TRANSFORM, hosting the Project Director and the Project Administrator
University of Copenhagen *KU-IFRO* *Department of Food and Resource Economics*	The Department carries out basic, applied and business-oriented social science and humanities research in a multidisciplinary setting, embracing economics, law, sociology, political science, development studies and bioethics. The Department engages in the project to further develop the economic and legal opportunities for green transformation	The key contributions from the project team are environmental and agricultural economics as well as law and analyses of legal frameworks. The team has rich experience with disciplinary analyses as well as interdisciplinary cooperation and development from extensive lead and participation in Danish, European and international projects as well as advisory activities.
University of Copenhagen *KU-BIO* *Department of Biology*	The Department has capacities in a broad range of biological sciences including ecological sciences, conservation science, biodiversity and nature management. The Department engages in the project to strengthen the research profile in sustainability, including solutions to the current extinction crisis	The role of BIO's scientists in TRANSFORM is to contribute data and know-how on spatial conservation planning, including identification of the potentials of biodiversity at local, regional and national scales aiming at effective biodiversity conservation.

University of Copenhagen *KU-ANTRO* *Department of Anthropology*	The Departments research effort seek to understand changes by scrutinizing global and local ecology and the connection between them. The relation between humans and the environment is highly dynamic and environments are related and degraded in complex relation between living and material actors. The project fits perfectly to the ambition of the Department, as it can demonstrate how anthropology can contribute to concrete efforts in society.	The Departments contribution is to provide knowledge and practice in the anthropological aspects of the transformation process. To contribute to the collaborative aspects of the implementation of the transformation plans, as they are expected to unfold in the LLs
University of Copenhagen *KU-IVH* *Section for Animal Welfare and Disease Control*	The section does research in animal welfare and disease control from a population and societal perspective. Different sets of animal ethics and their influence on the understanding of animal health, and animal welfare is a key area. The section will participate in TRANSFORM due to the focus on integrated solutions of future farming where animal husbandry will undergo a change, and the role of production animals will be regrounded and coupled to sustainable landscape and nature management.	The Departments contribution is to engage in the husbandry related sociological aspects of the transformation process, in particular to contribute to the aspects of the regulatory aspect in WP3, the implementation of the transformation plans of WP4, and the development of new business models in WP5
University of Copenhagen *KU-SAXO* *The Saxo Institute*	The Institute hosts the Centre for Sustainable Futures (CSF), which is a leading research center for the environmental humanities in Denmark, particularly in terms of interdisciplinary collaboration between the humanities, social sciences, and natural sciences. The key competencies are fieldwork-based, ethnographic and cultural historical studies of human-environment relations, all of which are made to inform work on sustainability across and beyond academia. These competences are also the reason CSF participates in TRANSFORM.	The Institute contributes with fine-grained analyses of both prior land reforms and present-day practices that format land use in Denmark, with the aim of better understanding how deep-seated structures of society, history and culture may work as barriers for land use change or, conversely, be mobilized as vehicles for transformation.
Aarhus University *AU-AGRO* *Department of Agroecology*	The Department is a stronghold in agroecology, i.e., the interaction between plants, soil, animals, environment, climate and people, and coordinates impact assessments for the Danish Government, supporting the green transition of society. Hosts the Land-CRAFT.dk Pioneer Center for Landscape Research in Sustainable Agricultural Futures and is a world leader in research related to nitrogen and carbon cycling, greenhouse gas emissions/climate effects, and land use, integrating sustainability dimensions in agricultural landscapes and LLs.	Core contributions include sustainability impact assessments and development of farming systems with nature-based solutions for low emission, improved nutrient and land management at the farm, landscape and national/regional level, via integration of spatiotemporal data and modelling.

Aarhus University *AU-BIO* *Department of Biology*	The Department has strong capacities in biodiversity, from minor genetic variations to taxonomic and ecosystem-level variability. The research contributes to the ongoing discovery of new life forms, from novel microorganisms on the ocean floor to new plant life in tropical rainforests. The Department examines biodiversity through an evolutionary lens to determine how the organisms we observe came about.	In TRANSFORM AU-BIO will contribute knowledge of biodiversity, future land use scenarios and planetary boundaries in WP2 with strong links to the LLs work of WP4.
Aalborg University *AAU* *Sustainability and Planning Department*	The Department has strong capacities in ethnographic studies and collaborations with practice partners, including design and facilitation of interventions and collaborative spaces and fieldwork-based studies of spatio-temporal planning contexts. The participation in TRANSFORM is aligned with the research profile of the Department and will strengthen the profile	The contribution is focused on research in planning conflicts, interest-based negotiations, and time studies, as well as approaches, methods, and tools for collaborative- and deliberative planning processes. AAU will contribute to the action-oriented efforts in collaborative planning and governance, taking a leading role in the development of new approaches and methods for collaborative planning processes that can support land transformations
Roskilde University *RUC* *Department of People and Technology*	The Department is focused on solution driven research addressing environmental transformation, societal crises, and transformations processes through interdisciplinary cooperation. The Departments´ Landscape Solutions Lab coordinates fundamental and solution driven research on landscape systems, land use transformations, land- and habitat management, agricultural value chains and sustainable agri-food systems.	The main contribution to TRANSFORM is spatial modelling as a tool in solving research tasks. These competences are brought into the project to lead and coordinate research activities on integrated spatial modelling of land use systems in transformation.
SEGES Innovation	SEGES Innovation plays a strong role in developing and implementing tools for the farming sector. SEGES Innovation holds a vast amount of activity data from most Danish farms. SEGES has strong competences in building innovative platforms for creating knowledge and tools for local farm advisors advising individual farmers and groups of farmers. SEGES is responsible for the catchment officers establishing strong partnerships with other actors, securing a successful process in the catchments when transforming landscapes by introducing e.g., wetlands.	The key contributions will be knowledge on farm business models and farmers behaviors and tools and data for the farming sector which can be used in the work for a more sustainable agricultural and food production. Knowledge of how to communicate with various stakeholders. Finally, SEGES Innovation contributes to the overall TRANSFORM co-leadership and management, particularly in relation to the local and relations in the project.

CONTRACTED PARTNERS

Danish Environmental Portal *DEP*	DEP serves as a data hub for information related to environment and land use in Denmark. DEP operates 29 IT systems related to environment and land use in Denmark. DEP participates in the project to get access to state-of-the art research expertise in land transformation including state-of-the art modelling approaches. This is vital, as the national implementation projects tend to miss the broad research perspective.	DEP will be able to link TRANSFORM with the on-going main national projects related to the land use reform thus ensuring that the results developed in TRANSFORM are used in public IT systems, link to national, regional and municipal public stakeholders, The role of DEPs in TRANSFORM is to contribute to data management, application interfaces and user interface development as well as linking TRANSFORM with national and local initiatives initiated by the public authorities, thus ensuring synergies and joint action.
Mølbak Chartered Surveyors A/S *Mølbak Rådgivende Landinspektører*	Mølbak is one of the largest chartered surveyors' companies in Denmark and is active in the market for property development and changes in both urban and rural areas, and have a specific knowledge and experience on land and rights acquisitions, expropriation (mandatory) and land consolidation (voluntary) regarding large infrastructure and utility projects etc. A transformation of agricultural areas to nature and climate adaptation areas etc. and development of new ownership models will result in significantly increased tasks in rural areas for chartered surveyor companies throughout Denmark - both the scope of tasks that chartered surveyor companies carry out today (cadastral tasks, planning tasks as well as area and rights tasks), but also new types of tasks and collaborative relationships.	Mølbak will contribute to develop and describe the legislative, organizational, and systemic changes that are necessary to ensure an effective land reform. The main role in TRANSFORM will be to provide expertise in legal measures and property development tools.

Urland	Urland is a private consulting firm that develops visions, strategies and planning for sustainable development in smaller urban communities and in the countryside. Urland has more than 10 years of experience in developing physical plans and citizen involvement, contributing to sustainable development in rural communities. Urland has strong competencies in inclusion, visualization, landscape, agricultural systems, environmental studies, physical planning and planning law. Urland helps associations, municipalities, foundations, and local investors with new projects that can create development opportunities in a sustainable balance with the local area.	Urlands team of architects, engineers, geographers, urban planners and land surveyors, will contribute to develop realistic solutions that create cohesion between cities and the countryside, farmers and consumers as well as nature and people. Urland will contribute knowledge, analyses, and practical experience to TRANSFORM.
Fjordland	Fjordland is one of the largest advisory companies in the agricultural sector of Denmark. Fjordland gives advice to conventional and organic farming, large and small farms, full-time and part-time farmers on economic, agronomic, and environmental issues in relation to farming. Fjordland wants our members being able to benefit from a thorough re-planning of the landscape. Current field allocations provide farmers with a wide range of challenges in relation to production. Re-allocation can also provide opportunities to benefit biodiversity, stop climate emissions and ensure that rural settlements remain attractive. This project will be able to benefit the farmers at the same time as it will be able to deliver on many of the great challenges of our time.	Fjordland contributes with a strong local network, especially in the Lemvig LL area. Fjordland will further contribute with knowledge about farming in the region. The development of new farming business models is of core interest for the company.
Lemvig Municipality	As a municipal authority, Lemvig Municipality is involved in, for example, planning in the open countryside, the green transition, nature conservation and restoration, establishment of wetlands, and other topics that needs to be highlighted further in TRANSFORM. Lemvig Municipality's engagement in the project is motivated by our desire to contribute to the local, national, and global agenda of using data-based knowledge and tools for intelligent future planning of our land use, based on our own municipality.	Lemvig Municipality will contribute with local knowledge, collaborative relationships, locations, and municipal practices in our LL.

Lolland Municipality	Lolland Municipality find it relevant to address how to make large, cohesive natural areas across Lolland, how to find multifunctional solutions where for instance wind and solar energy can be combined with for instance wetlands and as a municipality where agriculture has an important role, the knowledge of how to find new ways for the future farming is of key interest.	Lolland Municipality will contribute with local knowledge, collaborative relationships, locations, and municipal practices in our LL.
Silkeborg Municipality and the Gudenaa Committee	Silkeborg Municipal is responsible for the general planning in the open countryside, nature conservation and restoration, establishment of wetlands, all topics that are relevant for TRANSFORM. Silkeborg is the chair of the Gudenaa Committee which is a committed cooperation between eight municipalities in the Gudenaa catchment area, and the implementation of the GTA is expected to be implemented in this forum. Silkeborg Municipality's engagement in the project is motivated by the wish to contribute to the planning of our land use, based on the interests in the Gudenaa Catchment.	Silkeborg Municipality and the Gudenaa Committee will contribute with local and regional knowledge, collaborative fora, access to stakeholder fora, locations and practices in the LL.
Gate 21	Gate 21 is a partnership of municipalities, regions, businesses and knowledge institutions working together to ensure climate action. The municipalities in the Eastern part of Denmark, including the Municipality of Lolland are partners in Gate 21. Among other issues, the partnership help municipalities prioritize land interests and coordination across municipalities so that we in Denmark use our land in the best possible way. This includes projects such as strategic land use planning, lowland set-aside and energy communities.	In TRANSFORM Gate 21 will be involved in WP4, working closely together with the other partners in the Living Lab in the Municipality of Lolland. Gate 21 will contribute with competences on collaborative approaches and stakeholder involvement.
VKST	VKST is a large advisory service dealing with the agricultural sector. VKST have a focus on farmers should benefit from the Green Tripartite process of Denmark. VKST is aware of the opportunities for farmers and the society to harvest wide range of benefits in relation to agricultural production, biodiversity, GHG emissions and the liveability in rural districts. Its our hope that the TRANSFORM project will benefit the farmers alongside with the delivery of services demanded by the broader society.	VKST contributes with excellent sector contacts and local networks for the farmers in the LL on Lolland.

VELAS	VELAS is a large advisory service providing services for the Danish agricultural sector. Velas want to find ways for farmers in a future where the Green Tripartite will be implemented. Velas give advice on all aspects of farming including financial issues, agricultural production, environmental issues, climate mitigation and adaptation, biodiversity, energy, regenerative farming and forestry.	Velas will be able to contribute with local network especially in the Silkeborg / Gudenaa LL area

NON FUNDED PARTNERS

Ministry of the implementation of the Tripartite agreement *1. Agency for Green Transition and Aquatic Environment* *2. Nature Agency*	The main task of the new Ministry of the Implementation of the Green Tripartite Agreement will be the extensive conversion of agricultural land to nature and forests, improving the Danish aquatic environment and supporting sustainable agricultural and food production.	The ministry's agencies engage in a mutual cooperation with the contribution of updated knowledge on the implementation of the GTA, and will benefit from the immediate transfer of knowledge from TRANSFORM
Nykredit	Nykredit is a Danish financial group with banking and mortgage credit as the two core elements. In addition, Nykredit has activities within insurance, leasing, pension and property brokerage. Nykredit finds the project very relevant as it addresses issues of importance for future lending.	Among other things, we see value in gaining greater predictability in investments and in making it visible that we lend to sustainable businesses. Finally, we find it useful to have greater clarity about which elements should be given value in relation to the work on biodiversity. We also believe that we can contribute to the project with our knowledge of agricultural credit conditions.
Danish Association for Nature Conservation	The Danish society for Nature Conservation is the largest nature conservation NGO in Denmark	The Danish society for Nature Conservation our commitment to TRANSFORM includes participation as an observer in the projects advisory and SPBs. The intentions of the TRANSFORM project fits well with the ambitions of our society. We at The Danish society for Nature Conservation look forward to working with the project partners and stakeholders to make TRANSFORM a success.
Danish Industry *DI*	Danish Industry is Denmark's largest, most representative and most influential business and employers' organization, covering manufacturing as well as service industries across sectors such as transport, energy, IT, health, trade and professional services. The intentions of the TRANSFORM project fit well with the ambitions of DI and our other work on biodiversity, land use, and sustainability, as well as food production and sustainable energy production.	DIs commitment to TRANSFORM includes participation as an observer in the projects advisory and SPBs. We at DI look forward to working with the project partners and stakeholders to make TRANSFORM a success.

8 POTENTIAL AND EXPECTED IMPACT

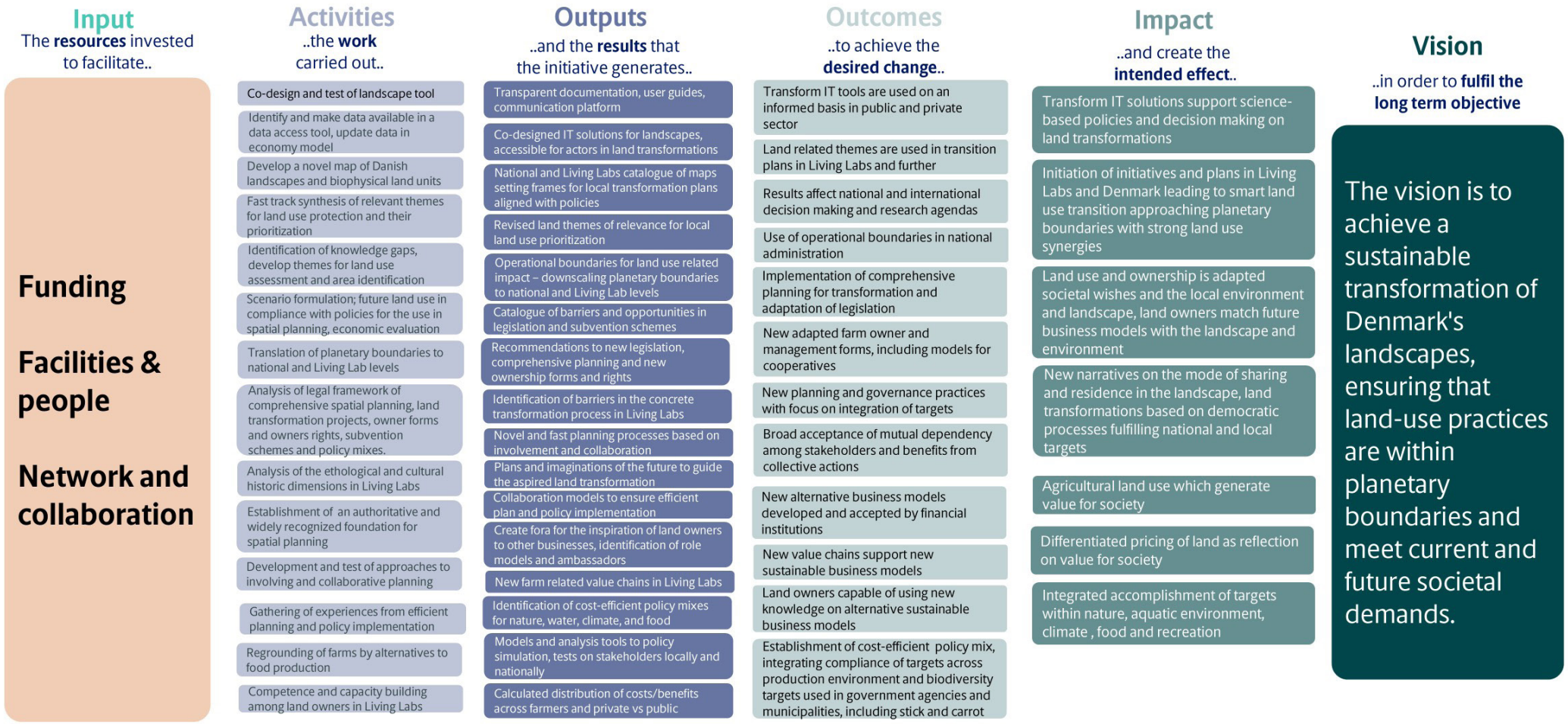
TRANSFORM has the intention and potential to influence, guide and drive land use transformation processes in order set society on a course towards a sustainable development as stipulated by the GTA. The project will act as a blueprint for the land transformation process, which the Danish society faces in the light of the GTA, and will contribute to solutions, which will strengthen the implementation of international, national and local targets on nature, climate and environment.

This impact will reach stakeholders at several levels. The project consortium intends to affect individual landowners, the farming sector, the civil society, NGOs, business organizations, municipalities, government agencies, decision- and policy makers. This will be accomplished through a concerted and targeted effort in LLs with local and regional stakeholders and in carefully casted and curated policy communication fora with national stakeholders.

The key to impact is a close collaboration between researchers and project business partners on the one side, and LGT, administration and governance bodies, landowners, businesses and civil society on the other. This selection of stakeholders to be included in LLs and in the SPB reflects the intention and scope of the GTA.

The project will have impact both in terms of the land use and land use changes in the concrete biophysical landscape, and in several policy realms, in spatial planning, in the farming sector, in the collaborative governance of landscapes, in the legislation and cadastral administration, and in economy and finance pertaining to land use. A key impact of TRANSFORM is through the IT solutions, which support science-based policies and decision making on land transformation.

Logic Model –TRANSFORM



novo nordisk **foundation**

THE LAND USE OF BIO-PHYSICAL LANDSCAPE

TRANSFORMs' data and landscape model solutions will support informed decisions regarding land use and concrete land use changes in the land transformation processes. The land use changes will fulfil national and international agendas including more nature and space for biodiversity, a larger forest cover, rewetting of carbon rich soils, the protection of the aquatic environment and protection of groundwater. The project will contribute to set new standards for allocation of land uses approaching planetary boundaries and will provide guidelines for strong land use synergies and multifunctional land use models. The project will guide decisions regarding land sparing and land sharing strategies.

LAND USE RELATED POLICIES

TRANSFORM will via the intense and close contact with policy makers inform the policy realms of biodiversity, environment, agriculture, and climate. The policy development for a green transition is dependent on sound scientific inputs, and a major impact of the project will be a knowledge-driven and informed decision support to policy development. Land use and ownership is adapted to societal wishes and the local environment and landscape as a result.

LAND USE PLANNING

TRANSFORM will impact the official and statutory planning processes of the Danish society from the steps of formulating targets to the implementation phase. The project will impact the formulation of the GTA transformation plans, the integration of transformation plans with the statutory municipal plans, and the integration of transition plans with the water and nature planning as stipulated by the EU Water Framework and Natura 2000 Directives. The project will guide the coordination between the different administrative bodies responsible for the different planning systems. Initiating initiatives and plans in LLs and Denmark in general will lead to smart land use transition approaching planetary boundaries with strong land use synergies.

LEGISLATION AND REGULATORY TOOLS

TRANSFORM will influence the revision of existing and formulation of new legislation, regulatory tools and models of conversion of properties, and thereby changing the legal framework of the Danish landscape.

FARM BUSINESSES

TRANSFORM will influence the way future land use and land ownership is adapted societal aspirations and needs, and the local environment and landscape. The impact will be visible as an initiation of a process where landowners match their future business models with the landscape and environment- The project will point at concrete value chains and business models which can shape a future sustainable farming

SOCIAL PROCESSES, COLLABORATION AND CO-CREATION

TRANSFORM will impact the way landscape and land resources are being managed. The project will shape the future narratives on the mode of the sharing of and living in the common landscape and how we as citizens in the future will reside in the landscape. Further, the consortium will contribute to new collaborative models, new co-creative means of shaping the future landscape and a new consciousness on the development pathways in local landscapes. TRANSFORM will impact the future democratic processes in the land transformation and its fulfillment of national and local targets.

ECONOMY

TRANSFORM will assist in the development towards agricultural land use which generate value for society, including regimes for differentiated pricing of land as reflection on value for society. The project will impact the way society reach integrated solution fulfilling targets within nature, aquatic environment, climate, food and recreation in a sound cost-efficient manner.

9 SUCCESS CRITERIA AND KEY PERFORMANCE INDICATORS

WP	SUCCESS CRITERIA	KPI
WP0	Set up and manage the TRANSFORM project.	Timely delivery of all WP0 milestones and deliverables.
WP0	The Living Labs are established and deliver co-created solutions to the Green Tripartite Agreement.	Three Living Labs established Six Living Labs workshops are arranged per year. > 200 participants in the Living Lab workshops per year.
WP1	Refined data and maps to support the land transformation are tested in Living Labs. Maps and data are easily available to end users and used by stakeholders in the transition process and available to the public.	Relevance and usability of data and maps are rated high in Living Labs. > 10 data sets and maps can be accessed freely online. > 5000 accesses per data set annually
WP1	IT-tools to support the land transformation are co-created in Living Labs and available to end users.	Participants in co-creation rate the process high. > 2 IT-tools can be accessed by the end users in the land transformation. > Half of the users in target user groups (e.g. local Green Tripartites) have used one or more of the IT-tools (online survey).
WP2	Assessment maps for land use themes nutrient loss, carbon rich soils, potential biodiversity have been curated or developed and tested in Living Labs.	Relevance and usability of assessment maps are rated high in Living Labs (Menti polls at each workshop). Local maps on the key land use themes. delivered to Living Labs and national maps to WP1.
WP2	Planetary Boundaries related to land use impact tested in Living Labs and defined for all municipalities.	> 4 municipality level Planetary Boundaries related to land use impacts delivered to Living Labs and to WP1.
WP3	Models for a new comprehensive transformation planning tool and legal barriers and opportunities identified and aligned with Living Labs.	1 national event presenting Green Paper with recommendations on future planning and policy mixes to national stakeholders (with WP6).
WP3	New farm owner and management forms, including models for cooperatives developed in Living Labs.	3 demonstration events in Living Labs Inspirational information is available at SEGES digital platform.
WP4	Gathering experiences from efficient planning and policy implementation on land use transition.	10 examples published continuously for inspiration.

WP4	Co-create collaborative approaches to land use transition planning and implementation in the living labs.	Participants in co-creation rate the process high (Menti polls at each workshop). Land use transition plans co-created in 3 Living Labs. > 1 communication on social media per month on planning experiences in Living Labs. > 4 written communications (e.g. practice briefs and knowledge notes) per year on planning experiences in Living Labs.
WP5	New alternative business models aligned with the green transition process developed in Living labs.	2 demonstration events in each Living Lab.Inspirational information is available at SEGES digital platform.
WP5	New value chains to support the new business models developed in Living Labs.	2 demonstration events in each Living Lab. Inspirational information is available at SEGES digital platform.
WP6	Models and analysis tools to policy simulation updated, refined and tested in LLs and with national stakeholders.	3 policy scenario simulations for Living Labs and at national level delivered to Living Labs and to WP1.
WP6	Policy evaluation of alternative scenarios modelled and tested in Living Labs.	1 national event presenting Green Paper with recommendations on future planning and policy mixes to national stakeholders (with WP3).
WP7	The progress and results of TRANSFORM are discussed in the Science-Policy Board, the Stakeholder Board and the Scientific Advisory Board.	> 10 meetings with actors, stakeholders and advisors. > 40 different participants.> 135 participants in total.
WP7	The progress and results of TRANSFORM are disseminated online and at physical events.	> 500 visits to the TRANSFORM website every month. > 500 followers of the TRANSFORM LinkedIn profile by the end of year one of the project. > 2 physical events per year arranged by TRANSFORM. > 10 participations by TRANSFORM partners a year in events arranged by others.

11 RISK ASSESSMENT

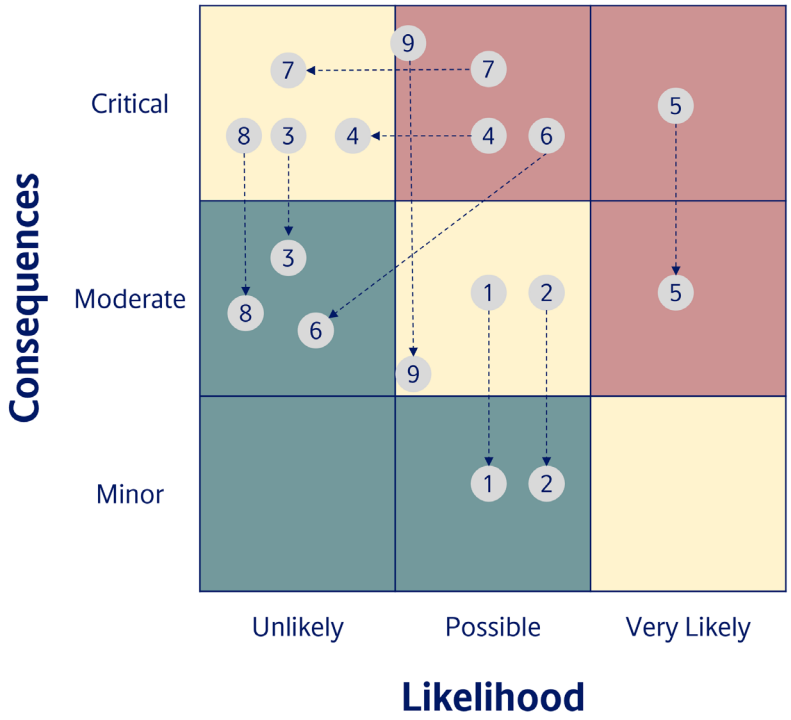
The project faces risks common to a large research and innovation project, but also risks originating from sources outside the project. The latter primarily because the project operates in a realm subject to strong political interests. Further, the project is operating in collaboration with public authorities subject to changes in priorities, budget constraints and staff problems.

Generally, the internal risks regarding recruitment and staff retention is prevented by a careful selecting of experienced senior staff individuals from institutions that are capable of mitigation by substituting the competences if lost from the project. The risks pertaining to data access and data update is prevented and mitigated by including the most prominent area data owners in the project as partners.

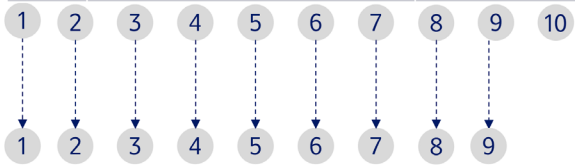
The most prominent risks comprise firstly the dependency on efficient communication between scientist and innovators on the one side, and practice on the other. This is a critical risk, and is prevented by including scientific staff members that are very experienced in action research and communication with practice. Further, this is prevented by including practice partners in the project to ensure impact and extension of knowledge.

Secondly, as mentioned, political events, changed priorities, altered financial situations and other unforeseeable factors, may compromise the implementation of the GTA. This situation is hard to prevent in project management, but we will follow the development closely, and by communication with the Impact Committee we will continuously re-align the project according to possible political changes. That said, the motivation and the needs behind project do not vanish with changed political realities. The environmental crises will prevail and call for solutions, keeping the relevance of the project despite possible other political priorities.

TRANSFORM – Risk Assessment



ID9	Risk	Prevention	Mitigation
	Give a brief summary of the risk.	*What can be done to lower or eliminate the likelihood?*	*What can be done to lower or eliminate the impact?*
1	Lack of competences	To lower the likelihood, the consortium is designed broadly with a high proportion of very experienced senior researches.	This research environment is attractive for young scientists to engage with. By recruiting talented young scientists the lack of competences is mitigated.
2	Resignations of key participants	To lower the likelihood, we aim at creating an attractive project environment, all senior partners have fixed positions and are not close to retirement in the project period.	To lower the impact we have safeguarded that all institutions have complementary staff members to take over if necessary.
3	Lack of data	To lower the likelihood responsible data owners are partners in the project. We have access to very comprehensive dataset, and have guaranteed access to new relevant data.	In the event of data cavities, we have a plan of data alternatives for all the critical data needed. The data alternatives are typically older datasets.
4	Mismatch between developed models and tools and the end-user needs	To lower the likelihood we stress continued and intense contact between scientists developing models and decision support tools and representatives for the end users in Living Labs.	If mismatches occur, we strengthen the Living Labs with experts in co-creation and, both in terms of digital tools and social processes.
5	Lack of alignment with knowledge needs for the implementation of The Green Tripartite Agreement	We will work closely with the relevant authorities to identify knowledge gaps that can be solved by the project.	To lower the impact of we will arrange workshops with key ministry officials to realign the process.
6	Lack of resources to integrate unforeseen knowledge needs	The Consortium Agreement will include measures to integrate new tasks and allocate the necessary funds.	Larger changes in needs will be discussed in due time with the funding bodies.
7	Insufficient contribution of the knowledge generated in the project to the public debate	Resources are allocated for communication, dissemination and engagement of the public. The participation in public debates is a dedicated task in WP7.	In the case of insufficient communication, we will involve additional communication staff and redefine the communication methods, channels and target groups.
8	Lack of resources and support from invited authorities and other stakeholders in the co-creation process	To reduce the likelihood we will have a continued collaboration with key personnel in government agencies, municipalities and other stakeholder groups of the Living Labs	Ultimately we will find other municipal partners. In the case of government agencies we will refer to the collaboration agreements formulated and urge at reestablishing project involvement.
9	Changes in the political realm which alter the framework of the implementation of the Green Tripartite Agreement	There is not much the project can do to reduce the likelihood, hence mitigation is the main factor	The impact may be lowered with a close contact to the partners represented in the Impact Committee, which can provide guidance for the meaningful continuation of the project, despite changes in political priorities.



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