

TANIA

Päijät-Häme Action Plan - Apply structural funding priorities for implementation of novel remediation techniques

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General Information

Project	TANIA
Partner organisation	University of Helsinki
Other partner organisations involved (if relevant)	Regional Council of Päijät-Häme
Country	Finland
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Policy Context

The Action Plan aims to impact:

Investment for Growth and Jobs programme	YES
European Territorial Cooperation programme	NO
Other regional development policy instrument	NO

Name of the Policy Instrument(s) addressed:

ERDF 'Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme'; priority 4.1 *Developing research and innovation concentrations based on regional strengths*

Further details on the policy context:

General information of the TANIA project and the situation of remediation in Finland

TANIA is an Interreg EU funded project which aims to

- Create new business opportunities for enterprises promoting nano and novel remediation products and services.
- Raise awareness on contamination of EU natural heritage, its effects and the potential of nano and novel remediation.
- Promote long-term, sustainable regional development and competitiveness: better environmental conditions, consequent improvements to health and increased business opportunities

In Europe 14% of c.2.5 million potentially contaminated sites are in need of remediation. Nevertheless, rehabilitation of contaminated areas is expensive. Around €6.5 billion per year is spend for cleaning contaminated groundwater and soil areas and 42% of this comes from public budgets.

At the moment, especially in Finland, the remediation techniques used are also environmentally and climatically unfriendly. Most of the remediations are executed by soil replacement, which requires excavating the contaminated soil, transferring it to landfill etc. and replacing it with pristine soil from somewhere else. An alternative to this *ex situ* remediation technique are *in situ* methods, techniques which clean the soil or groundwater on the spot and doesn't require as much logistic or fossil fuels as the more traditional remediation methods. Some *in situ* methods have been used for years but still new ones, which will save time and money and reach better remediation results, are still needed to shift the practice of using *ex situ* methods towards more environmentally friendly *in situ* techniques.

Through TANIA, partners from 5 regions support wide and effective application of nano and other novel remediation techniques for contaminated soil and water. Nanoremediation is a low-cost, safe and effective technique to clean up pollution, improve current treatments and prevent future contamination. Before TANIA, effective application of nanoremediation and

other novel remediation techniques was limited by issues concerning technological novelty (need for further R&I, lack of standardized methodologies, patenting and pilot applications, understanding) and the governance model (engaging various policy departments and multi-disciplinary stakeholders) in the TANIA partner regions. Interregional exchange and participation of stakeholders from environmental and innovation fields are used to address these limitations in TANIA. Partners compare different experiences on techniques to treat contamination, innovation in environmental protection and governance.

TANIA partners' overall objective is to improve ERDF policy instruments and regional strategies to support more and better funding for nano and novel remediation implementation, coordinate governance models and evaluation criteria and insert integration between innovation and environmental protection in their strategic focus. To reach an improved ERDF support for nano and novel remediation implementation, TANIA partners have developed regional Action Plans.

Päijät-Häme Region Action Plan

This regional Action Plan was composed by TANIA Päijät-Häme partners; University of Helsinki and Regional Council of Päijät-Häme to improve ERDF, Axis 2: *Producing and using the latest information and knowledge*; priority 4.1 *Developing research and innovation concentrations based on regional strengths* to better support the uptake of nano and other novel remediation techniques in the Päijät-Häme region. In Päijät-Häme, the ways to influence the policy instrument are relatively limited to implementing new projects. Nevertheless, the priorities of Päijät-Häme regional development strategy and program 2018-2021, which guides the ERDF funding in the region, support reaching the targets of TANIA project as well.

In Finland, the actual ERDF programme document is not modified by the regions during the programme period due to its national nature. The way Interreg projects influence the funding instrument is to develop and direct individual projects. TANIA is influencing the ERDF programme by planning and directing the NANORAUTA project which, among other things, distributes knowledge about the new remediation methods to the SME sector, thus motivating innovators to start new businesses and to create growth for the established enterprises in the region.

The development of this Action Plan has been based on the principles of (i) interregional exchange of solutions and good practices between TANIA partners and (ii) participation of the authorities, universities and SMEs working with remediation. Interregional exchange included TANIA partner meetings and learning events, bilateral exchange events and share of good practices. The authorities, universities and SMEs working with remediation gave their support through participating in the Regional Stakeholder Group meeting held every semester.

This document is structured in four parts. After this introductory section, comes the policy context section, which contains an introduction to the Päijät-Häme regional strategy and the policy instrument ERDF, as well as to the environmental context of remediation in Päijät-Häme area. The policy context section is followed by an overview of the action envisaged by the Action Plan. The main part of the Action Plan is the final section of this document, where the action is

presented, specifying its background, activities, players involved, schedule and costs.

Policy context:

Introduction to the Päijät-Häme regional strategy and the policy instrument ERDF

Päijät-Häme region includes 9 municipalities with a bit over 200 000 people as inhabitants (2018). Local business is based largely on industry, although its employment impact has faded, and the service sector has grown. GDP of the region was 5,7 billion euros in 2018.

The *Päijät-Häme Regional Development Strategy and Program for 2018–2021* sets regional priorities and covers the region's smart specialization spearheads (RIS3) as well.

The **Päijät-Häme regional development strategy and program 2018 – 2021** has three priorities:

1. Increasing the attractiveness of the area,
2. Increasing the value of processing products and services, and
3. Testing and pilot actions in new growth areas.

The Päijät-Häme regional development strategy and program entails the following (RIS3) spearheads (i) circular economy, (ii) design and (iii) sports and experiences. The strategy follows cross-cutting principles such as UN's Sustainable Development Goals which guides the development of Päijät-Häme and its industries in a culturally, ecologically, socially and economically sustainable way. (Päijät-Hämeen liitto 2017)

The *Finnish Structural Fund programme for 2014-2020* especially supports employment and the competitiveness of small and medium sized enterprises (SME). The promotion of a low-carbon economy is the cross-cutting theme of the programme. There are five Priority Axes and 13 specific objectives in the programme. (Suomen rakennerahasto-ohjelma 2014) The European Regional Development Fund (ERDF) funds two of the programme's priority axes: (i) competitiveness of SMEs, and (ii) producing and using the latest information and knowledge.

The Uusimaa Regional Council coordinates the ERDF funds in Southern Finland. The Regional Council of Päijät-Häme is the intermediate body responsible for the '*Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme*'. The Päijät-Häme regional development strategy and program guides the funding of the projects in the area.

The Päijät-Häme region uses the policy instrument of interest, ERDF '*Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme*', to diversify its economic structure and increase the number of growing, innovative and internationalizing companies located there. Companies are encouraged to develop new products and services especially for the international market and to adopt the use of innovations that will promote productivity. SMEs are also supported in developing their growth potential and new business, in specialization and increasing network-like cooperation.

ERDF focuses on research, competence and innovation clusters. The measure should improve quality of the environment and sustainable use of natural resources, through R&I which develops exportable, emission reducing solutions in cooperation with businesses. The target is to improve the ability to cope with change through R&I. Measures focus on environmentally and material efficient technologies as well as bio and nanotechnologies. Funding is allocated to experimental work, demonstration and piloting and to introduction and commercialization of products and services developed in these phases. Results should include innovations, innovation

clusters and R&D investments; sustainable urban development, new practices and tools for innovation platforms; new green and creative economy business. R&I should develop and commercialize exportable, emission reducing solutions and seek answers to environmental questions.

Environmental affairs are included horizontally. It holds focus more on the regional interest of Pääjärvi-Häme on environmental affairs and related innovation. R&D&I infrastructure with regional businesses using piloting, testing and demonstration environments should be promoted and supported. ERDF priorities tick lot of the boxes for implementing novel remediation techniques and especially priority 4.1 *Developing research and innovation concentrations based on regional strengths* is supporting implementation results of the TANIA – project.

Environmental policy context of remediation in the Pääjärvi-Häme region

The national laws regulating remediation and protecting the environment state that the remediation should: minimize waste production, use natural resources as little as possible, utilize materials as efficiently as possible, and be safe for the environment and humans. *In situ* methods are considered to be good option considering the minimal waste formation and use of natural resources. *In situ* techniques also reduce the ecological impacts associated with remediation which includes excavation of soil from the ground. Nevertheless, the policy instrument does not include possible support for nano/innovative remediation even though nano/innovative remediation would enhance sustainable urban development, new practices and tools for innovation platforms; new green and creative economy business. One of the reasons for this regional and structural lack of support for nano/innovative remediation is the lack of knowledge among environmental authorities in Pääjärvi-Häme on alternatives that can be used *in situ*. Therefore, TANIA partners in Pääjärvi-Häme feel that the use of ERDF for implementing novel remediation techniques needs improving.

Details of the Actions Envisaged

ACTION 1

Apply structural funding priorities for implementation of novel remediation techniques

Policy Need	Typology of Policy Improvement
<ol style="list-style-type: none"> 1. To ease the remediation and environmental permission process for novel remediation methods. To get new remediation techniques into use in Finland, their testing and use in real remediation sites needs to be made easier. The most remarkable obstacle on the way of using new techniques more widely, is the difficulty of getting an environmental permission. In addition, environmental authorities often lack the adequate knowledge on new remediation technologies. 2. Influence the national authorities in a new funding period to better support promotion and the use of novel remediation technologies. The Finnish <i>OP Sustainable Growth and Jobs 2014 - 2020</i> does not include possible support for nano/innovative remediation even though nano/innovative remediation would enhance sustainable urban development, new practices and tools for innovation platforms; new green and creative economy business. One of the reasons for this regional and structural lack of support for nano/innovative remediation is the lack of knowledge among environmental authorities in Päijät-Häme on alternatives that can be used <i>in situ</i>. 	<p>New project.</p>

In Päijät-Häme, the ways to influence the policy instrument are limited to implementing new projects. Nevertheless, the priorities of Päijät-Häme regional development strategy and program 2018-2021, which guides the ERDF funding in the region, support reaching the targets of TANIA project as well. That is why implementing a new project responding to the needs identified became the only feasible way to improve the policy instrument.

3. Promote *in situ* -techniques instead of off-site –practices. At the moment *in situ* –techniques are in minor use in Päijät-Häme region. Digging up the contaminated soil is preferred since it is often faster, considered cheaper, and the outcome is secured. New laws regulating the exportation and landfill of contaminated soils puts pressure towards more *in situ* –techniques. Also, evaluation of contaminated sites and the land use through risk-assessment favours on site treatment, and when applicable, the soils should be cleaned only to the level that is necessary for the planned land use. Furthermore, new techniques often are *in situ* –techniques, which is why this policy need is very relevant in TANIA.
4. Bring in know-how of new technologies. This policy need relates to needs 01 and 02. The exchanges of new ideas and technologies between different regions and countries should be eased to find new techniques that could be used in Päijät-Häme. Currently, it seems that remediation is preferred to be done through old known methods, and new solutions are rarely searched or used in part,

because of lacking knowledge.

Overall Topic and Description of the proposed Policy Improvement

Overall Topic

This action aims to improve ERDF and guarantee regional support for implementation of novel remediation techniques by applying ERDF funding for a project which will combine the implementation of a novel remediation technique, easement of remediation bureaucracy, the economic improvement of the region and insertion of the number of companies in marginal remediation business sectors.

Specific Description

NANORAUTA project application was submitted as a direct result of TANIA, which brought stakeholders together and helped them to reflect on challenges and opportunities for novel environmental remediation techniques.

In this solution ERDF priority 4.1, *Developing research and innovation concentrations based on regional strengths* is improved to better support TANIA goals. Funding for a new project, NANORAUTA, was applied from ERDF. In NANORAUTA, University of Helsinki, the Lahti Region Development Ltd and Lahti University of Applied Sciences increase remediation knowhow and streamline the business of SMEs in the remediation sector by introducing and making a commercially viable new contaminated site purification method that companies could launch on the market: nanoiron and DC enhanced biostimulation. The project combines implementation of a novel technique for environmental remediation with ease of remediation bureaucracy.

In the beginning of the NANORAUTA project, small scale laboratory tests will start where basic principles for factors such as spreading of nanosize iron particles in various types of soil can be boosted using electrokinetics, and how these methods can be combined with biostimulation. The testing will continue in 2020 with larger scale tests at the Soilia research station. Finally in 2021 there will be one or several tests at a real site in co-operation with local remediation contractors. The risk assessment of the new method will be done 2021 and business plans for three local corporations 2020.

Also, the Soil Research Center SOILIA in Lahti, is developed to better fit for the needs of SMEs. Companies in the remediation sector are encouraged to develop new products

and services especially for the international market and to adopt the use of innovations that will promote productivity. SMEs are also supported in developing their growth potential and new business, in specialization and increasing network-like cooperation with universities, international contacts and each other.

By combining the implementation of novel remediation technique with the ERDF goals on diversifying economic structure of the region and increasing the number of growing, innovative and internationalizing companies in remediation sector the ERDF is better supporting implementation of novel remediation techniques in the region. This solution enhances ERDF goals: sustainable urban development, new practices and tools for innovation platforms, new green and creative economy business.

The project fills the ERDF indicators through which the improvement of ERDF is assessed. The new project reaches ERDF indicators through R&I that develops exportable, emission reducing solutions in cooperation with businesses.

The Regional Council of Päijät-Häme is committed to monitor the implementation of the project in order to define how the results can be used to further influence the current ERDF programme and other longer-term goals. The last main call was in 2019 and there will be one final call on the ERDF programme before the end of the period. The Council can also consider, if mechanisms for engaging with NANORAUTA beneficiaries in the monitoring phase, can be replicated.

Background

Regional / National input, including input from TANIA Stakeholder Groups

Päijät-Häme stakeholders addressed several policy needs and challenges regarding the implementation of novel remediation methods. They were very determined regarding what should be changed and in what way, on authority level, as well as in technical practice. From the stakeholders, came the idea of a project combining the application and implementation of a novel remediation technique and regional economic development on marginal remediation business sector. Table 1. lists the preparation stages of this Action Plan.

Table 1. Development of the Päijät-Häme region Action Plan.

Event	Date	Theme	Participants
Stakeholder group meeting	13.4.2018	Presenting presurvey (TANIA – Project review on current in situ remediation techniques) and discussing general aims of the action plan	8 participants
Stakeholder group workshop	24.8.2018	Workshop to refine ideas for the action plan	18 participants
Stakeholder group meeting	10.5.2019	Administrative challenges, risks and risk management of the use of nanoiron remediation methods	14 participants
Partner group meetings (UH and RCPH) held semiregularly	Semiregularly with 2 to 4 week intervals	Various themes related to administration bottlenecks, technical challenges, organizing stakeholder meeting etc.	3-6 participants

The partner group identified and repeatedly discussed several central needs related to the topic. These needs and topics were then presented at each of the stakeholder group meetings. Although the relative emphasis on different topics changed from meeting to meeting, in each case all aspects were touched upon:

	<ol style="list-style-type: none"> 1 To ease the remediation and environmental permission process for novel remediation methods. 2 Improve policy instruments to better support promotion and use of novel remediation technologies. 3 Promote <i>in situ</i> -techniques instead of off-site – practices. 4 Bring in know-how of new technologies.
<p>Transfer of TANIA Solutions</p>	<p>TANIA Interregional Exchange began by understanding challenges to nanoremediation. Partners considered the need for public support for R&I and pilot applications on eco-compatible and eco-sustainable technology. It considered the need to work with regulatory bodies to define standard methodologies to evaluate and approve application of novel techniques. NANORAUTA is designed to start addressing these needs. Several TANIA solutions have influenced the development of this policy improvement:</p> <ul style="list-style-type: none"> • LORVER strategy (Lorraine, France) • Dry cleaner's site nanoremediation: using a mixed technique of bioremediation and the application of zero-valent iron nanoparticles (nZVI) (Baranya, Hungary) • NANOBOND (Tuscany, Italy) <p>LORVER strategy is one of the good practices of TANIA project. A request by University of Helsinki for additional knowledge about LORVER was presented at the TEE6 in Pecs, Hungary (6.2.2019), and this was fulfilled at the bilateral exchange in Nancy (27.5.2019) that gave add-on insights of the solution.</p> <p>Dry cleaner's site nanoremediation was showcased at the interregional exchange events at TEE4 in Lahti (15.-16.5.2018) and at TEE5 in Heraklion (8.-9.10.2018).</p> <p>NANOBOND was presented at TANIA Kick Off (6.-7.2.2017), during a seminar and study visit. Exchange on solutions was carried out during sessions at 2 exchange events: TEE4 in Lahti (15.-16.5.2018) and TEE5 in Heraklion (8.-9.10.2018). Bilateral Exchange in Florence (17.1.2019) was a chance to exchange further on NANOBOND, with NANOBOND partners and the Managing Authority.</p>

	<p>All these solutions utilize new kind of remediation techniques that haven't been used in Finland before. They provided information on laboratory testing, piloting, real site remediation, eco-toxicological testing and commercialism. In particular the extensive theoretical background knowledge received as part of the LORVER strategy has helped in designing the NANORAUTA tests. All this knowledge was included as part of the plan for testing and piloting new remediation techniques in NANORAUTA.</p> <p>In addition to the technical expertise, these solutions work as guidelines for the policy improvement to the NANORAUTA project. All the solutions were financed by EU and national funds. In all of the cases, nanoremediation techniques were implemented by utilizing regional policies and the solutions were made to fit to regional development goals. In particular, NANOBOND was funded by ERDF ROP. It provided an example of how a proposal for innovation funding can cross disciplines and introduce innovation into environmental sectors. Furthermore, it is an example of collaboration between research, industry and regulatory bodies, which inspired the NANORAUTA consortium.</p> <p>All of the solutions have a large group of operators from different fields who combine the technical implementation with regional development strategy goals, which is exactly where NANORAUTA aims at. In the solutions a new technique is tested and demonstrated (NANOBOND, LORVER) or used in a real contaminated site (Dry cleaner's site nanoremediation) in cooperation with agents from different fields. The solutions are aimed to create products and processes in the field of environmental remediation which can be correlated with important impact for the regional goals in terms of new business opportunities, safety and environmental health.</p>
<p>Other input from TANIA project</p>	<p>The TANIA project has provided the general conditions, which support the exchange of knowledge and experiences and interaction with other regions having similar problems. The project management has supported these processes in a professional way.</p> <p>TANIA partners in Päijät-Häme ordered a presurvey from external consultant, <i>TANIA – Project review on current in situ remediation techniques</i>, to review in situ methods used in the last five years. The review focused on actual contaminated sites where in situ methods were used for soil or groundwater remediation.</p>

Work plan within TANIA Phase 1 – ELABORATION of the Action

Activities already undertaken at interregional and regional level in Phase 1

Since the last main ERDF funding call in Päijät-Häme was in March 2019, the activity for the policy improvement took place earlier than planned. In the spring 2018, with the help of project partners Päijät-Häme, TANIA partners came up with the best way to benefit the policy improvement, which was a new ERDF funded project. In the autumn 2018, with the help of Päijät-Häme TANIA stakeholders, the NANORAUTA project idea was formed and made to fit the ERDF indicators and regional strategy goals. At the end of year 2018, the NANORAUTA project application was submitted to the ERDF idea call and got very good results with minor adjustments. In the spring 2019, the full project application was drafted and bilateral exchanges between the owners of the solutions to be utilized in NANORAUTA took place. In March 2019, the NANORAUTA project application was filed for ERDF priority 4.1, *Developing research and innovation concentrations based on regional strengths*. In June 2019, NANORAUTA was accepted to be funded, but some minor changes were made to the budget. In June, SMEs and authorities in remediation sector were contacted and informed about the project and its upcoming events. The proposal was finally approved in September 2019 and NANORAUTA project has started with the first partner meeting. The members and extent of the stakeholder group has been discussed and members for a steering group have been nominated. The first stakeholder event will be the NANORAUTA workshop focused on methods discussions and education by invited national and international experts. The workshop will take place on November 18th in connection with the TANIA symposium. The first dedicated steering group meeting will be held in January 2020. During the autumn, the premises will be set and the equipment gathered for technical testing, which will commence before year-end in the lab, and during the spring at the SOILIA station. At the workshop, the technological combination nanoiron and DC enhanced biostimulation is introduced, and authorities and SMEs can tell the project partners what should be taken into account while testing and implementing the technique, so that at the end of the project, the SMEs really will have a product, that can be used to boost the local remediation business.

Work plan within TANIA Phase 2 – IMPLEMENTATION of the Action

Activities planned at interregional and regional level in Phase 2 (January 2020 – December 2021)

Activity / Description				Timing (month/year or specific date where possible)		
<i>Work Package 1: Enhancing company – university co-operation</i>						
Activities	2019		2020		2021	
	Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
Brokerage event together with companies, authorities and universities		X				

Profitability calculations for new methods			X	X		
Business plans (3 pcs) for companies who will start to use nanoiron-biostimulation-electrokinetics –methods				X		
Competitor analysis						X
(Code of Conduct) Method description and instructions for use nanoiron-biostimulation-electrokinetics –methods						X
Work Package 2: Increasing expertise in the Päijät-Häme region						
Activities	2019		2020		2021	
	Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
Method testing in the laboratory		X	X			
LAMK students work as trainees in the test phase of the method and in the contaminated site		X	X	X	X	X
Pilot scale testing at Soilia				X	X	
Marketing and communication material to raise awareness of Soilia			X			
Writing the article and/or report			X	X		
Testing the method in the real site				X	X	X
Work Package 3: Strengthening international cooperation						
Activities	2019		2020		2021	
	Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
A larger method developing workshop will be organized		X				
Developing the Soilia research unit together with international experts		X				
Final conference						X
Work Package 4: Raising awareness						
Activities	2019		2020		2021	
	Sem. 1	Sem. 2	Sem. 1	Sem. 2	Sem. 1	Sem. 2
Active communication and marketing through different channel		X	X	X	X	X
Needed writing materials (method instructions, code of conduct) will be done		X	X	X	X	X
Interviewing companies working on contaminated sites		X	X	X	X	X
Implementation of the communication plan of the project			X	X	X	X
Participation in Smart Cities in Smart Regions conference				X		
Comprehensive report of administrative challenges for contaminated sites and groundwaters to support authorities and decision-makers						X
Risk assessment for nanoiron-biostimulation-					X	X

electrokinetic -method using SoilRisk-programme						
Material and reports of this new method for SMEs working field of soil and water contaminations						X
<p>As part of the action, the NANORAUTA project is followed up by the Regional Council of Pääjärvi-Häme. As a specific activity, the Regional Council aims to organize a workshop where the ERDF funding specialists of Regional Council, together with NANORAUTA project partners discuss the ways in which the policy instrument and the regional strategy (<i>Pääjärvi-Häme Regional Development Strategy and Program, RIS3 included</i>) could better support the needs of NANORAUTA project during the project lifetime and vice versa. Also, ways of influencing the next programming period to better support projects similar to NANORAUTA are discussed. The upcoming forethinking and content preparation of the next regional development strategy could be discussed similarly.</p> <p>Participants: ERDF specialists of Regional council, HY, TANIA stakeholder group, LUAS, Ladec, SMEs</p>				18.11.2019		
Ex-post exchange with project beneficiaries for further use of the policy instrument, and to gather summarizing insight of the instrument.				End of 2021		

Stakeholders involved

Name of Organisation / person (where possible)	Role in Action Plan (c.200 characters)
University of Helsinki	Manager of the action
LADEC	A regional agency for business development is a project partner in the new project.
LUAS	A regional University of Applied Sciences is a project partner in the new project.
SMEs of remediation sector	Several companies are subcontractors in the new project. The NANORAUTA project will increase the co-operation, exchange of know-how and competitiveness of provincial SMEs.
Regional Council of Pääjärvi-Häme	Acts as a member of the NANORAUTA project's

	steering group, ensuring that the project is implemented as planned in the application. Regional Council is the intermediate body of the policy instrument.
TANIA regional stakeholder group	Taking part in some of the activities of NANORAUTA project, e.g. workshops
Finnish state authorities, such as ELY (Centre for Economic development, Transport and Environment)	Taking part in some of the activities of NANORAUTA project, e.g. workshops. A target group to be influenced through the new project.

Risk and Contingency Plans

Description of Risk	Level of probability (High, Medium, Low)	Description of Contingency Plan
NANORAUTA partners don't cooperate to achieve the results	Low	Partners are informed well in the application phase so that they know what is expected from them.
NANORAUTA receives funding and is implemented, but it doesn't meet the ERDF indicators, requirements and goals set to it.	Low	The project's steering group ensures that the project reaches its goals by monitoring it on a regular basis and supporting the implementation.
The TANIA lessons and solutions learned won't be utilized in NANORAUTA.	Low	NANORAUTA project has a lot of common with the chosen solutions and if the project gets funded the lessons learnt are already being utilized.

Costs and funding sources

Costs	Funding Sources
All the funding needed for the policy improvement is the budget of the new project funded by ERDF. The total budget of the NANORAUTA project is 424700 euros. The ERDF amount from that is 297.290€. There was also 28.626€ funding from Päijät-Häme	ERDF

region municipalities (awarded to LADEC) and 98.784€ funding from other public sources, i.e. co-financing by the participating partner organizations, University of Helsinki and Lahti University of Applied Sciences.

Monitoring

Self-defined Performance Indicators

Indicator	Target	Means of Verification
Number of businesses (SMEs) that launch R&D&I activities or cooperation with a university, higher education institution or research institution	4	NANORAUTA works in tight cooperation with the SMEs in remediation sector. In the beginning of the project SMEs are indent to the project activities and goals. For example, business plans considering the use of the new technique is made for companies which are interested of the technique. Cooperation with SMEs happens also through a tender in pilot and field testing and implementation of the new technique.

Output Indicators

Indicator	Target	Means of Verification
New innovation platforms	3	A new technique: nanoiron and DC enhanced biostimulation is developed and a business is created around it. Also Soil Research Centre is utilized and developed to better meet the needs of SMEs with the help of SMEs and TANIA partners. The laboratory facilities of University of Helsinki are utilized to fit the analysis needs for nanoiron, which haven't been done in the laboratory before.
New products and services developed and piloted in innovation platforms	5	The use of nanoiron, nanoiron biostimulation and nanoiron and DC enhanced biostimulation is tested and piloted. Service of SOILIA are better fitting for the use of SMEs. SMEs are involved in the development of SOILIA and their use of

		<p>SOILIA is monitored.</p> <p>Material of the bottlenecks of remediation bureaucracy is produced and printed for the use of SMEs and authorities in remediation sector.</p>
SMEs cooperating with region cities in innovation platforms	14	<p>Most of the SMEs involved in NANORAUTA are the same companies that already act in the TANIA stakeholder group. They have shown their interest towards NANORAUTA already in the project planning phase and their cooperation is monitored and enhanced through workshop etc.</p>
Companies taking part to project led by research institutions	14	<p>Most of the SMEs involved in NANORAUTA are the same companies that already act as TANIA stakeholders. They have shown their interest towards NANORAUTA already in the project planning phase and their cooperation is monitored and enhanced through workshops, tenders and business plans.</p>
New employments established	5	<p>Two persons are employed by the NANORAUTA project. Three employments will be created in SMEs of remediation sector. Through NANORAUTA, SMEs get a new product to use and market which will be reflected also to the need of employers. The formation of employments is followed throughout the project and enhanced through method development workshop and business plans made for the SMEs.</p>
Ex-post exchange meeting organized with project beneficiaries for further use of the policy instrument, and to gather summarizing insight of the instrument.	1	<p>This indicator will be monitored at the end of semester 2 in 2021. A brief progress report will be prepared.</p>
Territorial Impact		
<p>The objectives, measures and results of the NANORAUTA project support the Päijät-Häme regional development strategy and program (2018-2021). NANORAUTA contributes to the goals of</p>		

economic, ecological and social sustainability and equality in the Päijät-Häme region. In the project, the University of Helsinki, Lahti Regional Development LADEC Ltd and Lahti University of Applied Sciences intensify the expertise center of the contaminated site cleaning sector, which consists of universities, companies and public authorities in Päijät-Häme, and bring international expertise to the area. As a result of the project, the international cooperation, business and know-how of the contaminated land sector in the Päijät-Häme area will be diversified, administrative practices related to contaminated site cleaning will be eased and new efficient cleaning methods will be used in a versatile way, utilizing cooperation between universities and business. By mapping and discussing with the authorities, the administrative challenges associated with contaminated land purification, and by introducing and making a commercially viable new remediation method (nanotube-electro-kinetics biostimulation), the project will increase the know-how of contaminated site rehabilitation in Päijät-Häme and promote the business of remediation companies.

Taking in novel remediation methods along with generating new businesses in the region supports the newly elected European Green Capital 2021 image.

Date: 6.2.2020

Name of the organizations:

University of Helsinki

Regional Council of Päijät-Häme

Signatures of the relevant organization: _____

Laura Leppänen, Region Mayor
The Regional Council of Päijät-Häme

Sources:

Päijät-Hämeen liitto 2017. Päijät-Hämeen strategia ja maakuntaohjelma 2018-2021.

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