



## EU co-financiering jaarrapportage 2016 voor doorlopende projecten

<b>Algemene gegevens</b>	
TKI-Nummer	AF-EU-15021
Titel	<b>RECARE</b>
Topsector (A&F of T&U)	A&F
Projectleider (onderzoek)	Bij WENR (Alterra): Dr. R. Hessel. Overall project coordinator Prof. Dr. C.J. Ritsema (WU)
Werkelijke startdatum	1 November 2013
Werkelijke einddatum	31 Oktober 2018
Korte omschrijving inhoud (max. 4 regels)	RECARE richt zich op het samen met stakeholders vinden van maatregelen tegen bodembedreigingen. Resultaten van monitoring in 16 gebieden worden gebruikt om de toepasbaarheid en effecten op te schalen naar EU niveau.

<b>Planning en voortgang (indien er wijzigingen zijn t.o.v. het projectplan svp toelichten)</b>	
Loopt het project volgens planning?	Ja
Zijn er wijzigingen in het consortium/de projectpartners?	Ja, door overstap van enkele personen naar andere organisaties zijn er 2 project partners bijgekomen, en zijn er ook 2 vertrokken. Dit is geregeld door middel van een contract amendement bij EC. Amendement is goedgekeurd.
Is er sprake van vertraging en/of uitgestelde opleverdatum?	Nee

<b>Highlights: geef een korte beschrijving van de belangrijkste resultaten</b> (deze beschrijving wordt als publieke samenvatting op de websites van de TKI's/topsectoren geplaatst)
RECARE heeft een uitgebreide literatuurstudie gedaan naar bodembedreigingen in Europa, aangevuld met een 2 <sup>e</sup> studie naar maatregelen die genomen kunnen worden. In de 16 onderzoeksgebieden zijn inventarisaties gedaan naar bodemdegradatie en conservering, en zijn veelbelovende maatregelen beschreven met WOCAT (een internationale online database van maatregelen voor duurzaam bodembeheer). Daarna zijn in workshops met stakeholders maatregelen geselecteerd. De geselecteerde maatregelen zijn in de onderzoeksgebieden geïmplementeerd om ze te kunnen testen. Monitoring van de geïmplementeerde maatregelen is ten tijde van deze rapportage bezig. Een methodologie om de maatregelen te evalueren voor hun effect op de bodembedreiging, kosten en baten, en op diverse ecosystemendiensten wordt ontwikkeld. Een modellen-reeks wordt gebruikt om de resultaten uit de studiegebieden op te schalen naar Europees niveau. Tenslotte is er ook een uitgebreide studie gedaan naar de verschillende bodem-gerelateerde beleidsmaatregelen die in Europa gebruikt worden en naar effecten en samenhang daarvan. Alle projectresultaten worden beschikbaar gemaakt via een speciale website: <a href="http://www.recare-hub.eu/">http://www.recare-hub.eu/</a>
<b>Knelpunten: geef een korte beschrijving van de eventuele inhoudelijke knelpunten</b>
Er zijn geen inhoudelijke knelpunten. Enkele deliverables die waren voorzien voor 2015 zijn opgeleverd in 2016, maar dit heeft geen consequenties voor de tijdige oplevering van het project

<b>Aantal opgeleverde producten in 2016</b> (geef in een bijlage de titels en/of omschrijving van de producten of een link naar de producten op openbare websites)					
Wetenschappelijke artikelen	Rapporten	Artikelen in vakbladen	Inleidingen/workshops/invited lectures	Aangevraagde octrooien/first filings	Spin-offs (*)
19	5	32	30	0	0

(\*) Hiermee wordt bedoeld: contractonderzoek dat voortkomt uit dit project, aanvullende subsidies die zijn verkregen en spin-off bedrijvigheid.

Verwacht u het komende jaar een octrooiaanvraag?	NEE
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### **Bijlage: Titels van de producten of een link naar de producten op een openbare website**

Geef evt. toelichting op:

- Afwijking opgeleverde producten
- Reden van nog niet plaatsen van product op openbare website

#### *Wetenschappelijke artikelen*

Isabel Campos , Nelson Abrantes , Jan Jacob Keizer , Carlos Vale , Patrícia Pereira (2016) Major and trace elements in soils and ashes of eucalypt and pine forest plantations in Portugal following a wildfire. *Science of the Total Environment* 572, 1363-1376 DOI [10.1016/j.scitotenv.2016.01.190](https://doi.org/10.1016/j.scitotenv.2016.01.190)

Ioannis N. Daliakopoulos , Polixeni Pappa , Manolis G. Grillakis , Emmanouil A. Varouchakis , Ioannis K. Tsanis (2016) Modeling Soil Salinity in Greenhouse Cultivations Under a Changing Climate With SALTMED. *Soil Science* 181, 241-251. DOI [10.1097/SS.000000000000161](https://doi.org/10.1097/SS.000000000000161)

I.N. Daliakopoulos , I.K. Tsanis , A. Koutroulis , N.N. Kourgialas , A.E. Varouchakis , G.P. Karatzas , C.J. Ritsema (2016) The threat of soil salinity: A European scale review. *Science of the Total Environment* 573, 727-739. DOI [10.1016/j.scitotenv.2016.08.177](https://doi.org/10.1016/j.scitotenv.2016.08.177)

Hakan Djuma , Adriana Bruggeman , Corrado Camera , Christos Zoumides (2016) Combining Qualitative and Quantitative Methods for Soil Erosion Assessments: An Application in a Sloping Mediterranean Watershed, Cyprus. *Land Degradation and Development* DOI [10.1002/ldr.2571](https://doi.org/10.1002/ldr.2571)

M.T. Domínguez , J.M. Alegre , P. Madejón , E. Madejón , P. Burgos , F. Cabrera , T. Marañón , J.M. Murillo (2016) River banks and channels as hotspots of soil pollution after large-scale remediation of a river basin. *Geoderma* 261, 133-140 DOI [10.1016/j.geoderma.2015.07.008](https://doi.org/10.1016/j.geoderma.2015.07.008)

S.R. Faria , J.M. De la Rosa , H. Knicker , J.A. González-Pérez , J.J. Keizer (2016) Molecular characterization of wildfire impacts on organic matter in eroded sediments and topsoil in Mediterranean eucalypt stands. *Catena* 135, 29-37 DOI [10.1016/j.catena.2015.07.007](https://doi.org/10.1016/j.catena.2015.07.007)

R.V. Ferreira , D. Serpa , A.I. Machado , M.L. Rodríguez-Blanco , L.F. Santos , M.T. Taboada-Castro , M.A. Cerqueira , J.J. Keizer (2016) Short-term nitrogen losses by overland flow in a recently burnt forest area in north-central Portugal: A study at micro-plot scale. *Science of the Total Environment* 572, 1281-1288 DOI [10.1016/j.scitotenv.2015.12.042](https://doi.org/10.1016/j.scitotenv.2015.12.042)

R.V. Ferreira , D. Serpa , M.A. Cerqueira , J.J. Keizer (2016) Short-time phosphorus losses by overland flow in burnt pine and eucalypt plantations in north-central Portugal: A study at micro-plot scale. *Science of the Total Environment* DOI [10.1016/j.scitotenv.2016.02.036](https://doi.org/10.1016/j.scitotenv.2016.02.036)

Kohnová, S., Gaál, L., Bacigál, T., Szolgay, J., Hlavčová, K., Valent, P., Parajka, J., Blöschl, G. (2016) Process-Based Selection of Copula Types for Flood Peak-Volume Relationships in Northwest Austria: a Case Study. *Contributions to Geophysics and Geodesy* 46, 4

Julia Leventon , Luuk Fleskens , Heleen Claringbould , Gudrun Schwilch , Rudi Hessel (2016) An applied methodology for stakeholder identification in transdisciplinary research. Sustainability Science 11, 763-775 DOI [10.1007/s11625-016-0385-1](https://doi.org/10.1007/s11625-016-0385-1)

Peter Bilson Obour , Per Schjønning , Yi Peng , Lars J. Munkholm (2016) Subsoil compaction assessed by visual evaluation and laboratory methods. Soil and Tillage Research DOI [10.1016/j.still.2016.08.015](https://doi.org/10.1016/j.still.2016.08.015)

I. S. Panagea , I. N. Daliakopoulos , I. K. Tsanis , G. Schwilch (2016) Evaluation of soil salinity amelioration technologies in Timpaki, Crete: a participatory approach. Solid Earth 7, 2775-2805 DOI [10.5194/sed-7-2775-2015](https://doi.org/10.5194/sed-7-2775-2015)

Sergio Alegre Prats , Joseph W. Wagenbrenner , Martinho A. S. Martins , Maruxa Cortizo Malvar , Jan Jacob Keizer (2016) Hydrologic Implications of Post-Fire Mulching Across Different Spatial Scales. Land Degradation and Development 27, 1440-1452 DOI [10.1002/ldr.2422](https://doi.org/10.1002/ldr.2422)

João Ricardo Lavoura Puga , Nelson José Cabaços Abrantes , Maria João Saraiva de Oliveira , Diana Catarina Simões Vieira , Silvia Regina Faria , Fernando Gonçalves , Jan Jacob Keizer (2016) Long-Term Impacts of Post-Fire Mulching on Ground-Dwelling Arthropod Communities in a Eucalypt Plantation. Land Degradation and Development DOI [10.1002/ldr.2583](https://doi.org/10.1002/ldr.2583)

Per Schjønning , Mathieu Lamandé , Lars J. Munkholm , Henning S. Lyngvig , Janne Aa. Nielsen (2016) Soil precompression stress, penetration resistance and crop yields in relation to differently-trafficked, temperate-region sandy loam soils. Soil and Tillage Research 163, 298-308 DOI [10.1016/j.still.2016.07.003](https://doi.org/10.1016/j.still.2016.07.003)

Per Schjønning , Mathieu Lamandé , Valentin Crétin , Janne Aalborg Nielsen (2016) Upper subsoil pore characteristics and functions as affected by field traffic and freeze/thaw and dry/wet treatments. Ecological Indicators DOI [10.1071/SR16149](https://doi.org/10.1071/SR16149)

Gudrun Schwilch , Lea Bernet , Luuk Fleskens , Elias Giannakis , Julia Leventon , Teodoro Marañón , Jane Mills , Chris Short , Jannes Stolte , Hedwig van Delden , Simone Verzandvoort (2016) Operationalizing ecosystem services for the mitigation of soil threats: A proposed framework. Ecological Indicators 67, 586-597 DOI [10.1016/j.ecolind.2016.03.016](https://doi.org/10.1016/j.ecolind.2016.03.016)

Filipa Tavares Wahren , Stefan Julich , Joao Pedro Nunes , Oscar Gonzalez-Pelayo , Daniel Hawtree , Karl-Heinz Feger , Jan Jacob Keizer (2016) Combining digital soil mapping and hydrological modeling in a data scarce watershed in north-central Portugal. Geoderma 264, 350-362 DOI [10.1016/j.geoderma.2015.08.023](https://doi.org/10.1016/j.geoderma.2015.08.023)

Christos Zoumides , Adriana Bruggeman , Elias Giannakis , Corrado Camera , Hakan Djuma , Marinos Eliades , Katerina Charalambous (2016) Community-Based Rehabilitation of Mountain Terraces in Cyprus. Land Degradation and Development DOI [10.1002/ldr.2586](https://doi.org/10.1002/ldr.2586)

### *Rapporten*

De in 2016 verschenen rapporten zijn te vinden op zowel de RECARE website, als in het online ECAS systeem van EC. Op de website staan de rapporten in: <http://www.recare-project.eu/downloads-by-category/public-documents/project-deliverables>. Onderstaande links verwijzen naar ECAS; om te link te kunnen gebruiken dient men toegang te hebben tot ECAS.

[Report on current state of degradation and conservation](#) (Deliverable 3.2)

[WOCAT descriptions of all relevant prevention, remediation and restoration measures](#) (Deliverable 5.1)

[Stakeholder workshop reports](#) (Deliverable 5.2)

[Harmonized field monitoring strategy for assessing the effectiveness of the selected, innovative soil prevention, remediation, and restoration measures](#) (Deliverable 6.1)

[Up-to-date review of EU policies and integrated impact assessment methodology](#) (Deliverable 9.1)

#### Artikelen in vakbladen

Informatie hieronder gekopieerd uit rapportage aan EC, categorie 'articles in the popular press'. Deze categorie is mogelijk breder dan alleen vakbladen.

Naam partner	Titel artikel	Datum artikel
AARHUS UNIVERSITET	Achieve certainty for field damage at depth.	04/05/2016
AARHUS UNIVERSITET	Mitigation of soil compaction is technically possible	26/04/2016
AARHUS UNIVERSITET	Measurements of mechanical stress in the soil profile show interesting results	13/05/2016
AARHUS UNIVERSITET	More than 50% of traffic events provide risk of soil compaction	27/05/2016
AARHUS UNIVERSITET	We need to focus the compaction problem.	27/05/2016
AARHUS UNIVERSITET	Do you harm your soil?	06/05/2016
AARHUS UNIVERSITET	Tracks under the slurry trailer.	06/05/2016
THE CYPRUS INSTITUTE LIMITED	Restoration of dry-stone walls in Pitsilia	26/07/2016
THE CYPRUS INSTITUTE LIMITED	CyI: Celebrate with us the Soil Day at the 5th dry-stone terrace maintenance event in Platanistasa.	30/11/2016
THE CYPRUS INSTITUTE LIMITED	World Soil Day	30/11/2016
THE CYPRUS INSTITUTE LIMITED	Do you know what dry-stones are?	01/12/2016
Norwegian institute of Bioeconomy Research - NIBIO	Improving soils to boost crop productivity	05/12/2016
Norwegian institute of Bioeconomy Research - NIBIO	Farmers and researchers work together to save the European soil	05/12/2016
Norwegian institute of Bioeconomy Research - NIBIO	Cooperation to save European soil) ? Nationen (newspaper and web edition	05/12/2016
Norwegian institute of Bioeconomy Research - NIBIO	Cooperation to save European soil) ? regjeringen.no (Government web page)	07/12/2016
EVENOR TECH SL	How much does it cost to decontaminate the Guadiamar?	29/04/2016
EVENOR TECH SL	The Guadiamar, a lab for soil remediation.	14/05/2016
EVENOR TECH SL	Age of majority for the worst environmental catastrophe in Spain	25/04/2016
UNIVERSITAET BERN	The Lochstern digs potatoes from the water.	02/09/2016
UNIVERSITAET BERN	Dyker slows down erosion in potatoes.	10/09/2016
AGENCIA ESTATAL CONSEJO	The Board will act in the points of the	07/01/2016

SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Guadiamar contaminated by the discharge of the mine.	
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	The Board admits that there are heavily contaminated points in the Green Corridor.	08/01/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	The Board requests scientific advice to act on contaminated points of the Guadiamar.	19/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Guadiamar remains contaminated 18 years after the Boliden dumping.	24/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Following the trail to the restoration of Aznalcóllar.	25/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	CSIC scientists recommend cleaning the Guadiamar area because it is still contaminated.	25/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Age of majority for the worst environmental catastrophe in Spain.	25/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Guadiamar's contaminated soil is like a chronic patient who needs to be monitored.	26/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	How much does it cost to decontaminate the Guadiamar green corridor (and other soils)?	29/04/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Aznalcollar, 18 years and 500 million later.	02/05/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	El Guadiamar, a laboratory to recover soils.	14/05/2016
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	The resurgence after the catastrophe.	19/11/2016

### *Inleidingen*

Informatie hieronder gekopieerd uit rapportage aan EC, categorien 'Oral presentation to a scientific event' en 'Oral presentation to a wider public'

RE CARE partner	Titel presentatie	Datum	Plaats	Type publiek
UNIVERSITA DEGLI STUDI DI PADOVA	Suolo, servizi ecosistemici e sostanza organica. Il progetto RE CARE	15/01/2016	Lozzo Atestino (Padova)	Industry
STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Soil compaction in European context	28/06/2016	Wageningen	Scientific community (higher education, Research) - Industry - Civil

				society - Policy makers
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	Assessing Soil Salinity with the use of WorldView-2 Hyperspectral Images in Timpaki, Crete	17/04/2016	Vienna, Austria	Scientific community (higher education, Research)
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	An Open-source Low-cost Portable Apparatus for Soil Fauna Sampling	17/04/2016	Vienna, Austria	Scientific community (higher education, Research)
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	Can Tomato Inoculation with Trichoderma Compensate Yield and Soil Health Deficiency due to Soil Salinity?	17/04/2016	Vienna, Austria	Scientific community (higher education, Research)
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	Effect of Saline Water Drip Irrigation on Tomato Yield and Quality Characteristics under Mediterranean Greenhouse Conditions.	08/09/2016	Chania, Greece	Scientific community (higher education, Research) - Industry - Policy makers - Medias
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	Greenhouse Soil Moisture Deficit under Saline Irrigation and Climate Change.	01/06/2016	Chania, Greece	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias
THE RESEARCH COMMITTEE OF THE TECHNICAL UNIVERSITY OF CRETE	Bayesian Belief Network Analysis of Soil Salinisation Management Strategies	08/09/2016	Chania, Greece	Scientific community (higher education, Research) - Civil society - Policy makers
AARHUS UNIVERSITET	Horizontal stresses below two agricultural vehicles.	08/09/2016	Nanjing, China	Scientific community (higher education, Research)
AGRO INTELLIGENCE APS	Rubber tracks are still not good enough.	08/09/2016	Nanjing, China	Scientific community (higher education, Research)
AARHUS	Does heavy traffic have long term	08/09/2016	Nanjing, China	Scientific community

UNIVERSITET	implications for crop yields.			(higher education, Research) - Policy makers
RESEARCH INSTITUTE FOR KNOWLEDGE SYSTEMS BV	Application of a soil-related ecosystem services framework to support European policies.	19/09/2016	Antwerp, Belgium	Scientific community (higher education, Research) - Policy makers
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Caracterización físico-química de suelos desnudos en el área afectada por el vertido minero de Aznalcóllar	30/06/2015	Bilbao, Spain	Scientific community (higher education, Research)
THE CYPRUS INSTITUTE LIMITED	Assessment of dry-stone terrace wall degradation with a 3D approach.	17/04/2016	Vienna, Austria	Scientific community (higher education, Research)
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Plant-soil interactions in degraded and remediated soils	16/06/2015	Coimbra, Portugal	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	An overview of research into soil (fertility) losses in recently burnt areas in the Iberian Peninsula: what's next?	19/11/2015	Malaga, Spain	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Conservação da água e do solo. Que futuro? ? o caso de gestão pós-fogo em Portugal.	15/06/2016	Coimbra, Portugal	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Prevenir e Remediar Ameaças ao Solo ? A Abordagem do Projeto RECARE. Seminário Caramulo, que Floresta no Futuro?	14/03/2015	Tondela, Portugal	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Fenómenos erosivos e gestão de linhas de água.	23/04/2015	Azambuja, Portugal	Civil society
AARHUS	Horizontal stresses below	01/09/2015	Nanjing, China	Scientific community

UNIVERSITET	two agricultural vehicles.			(higher education, Research)
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Tree-soil interactions and the provision of ecosystem services in contaminated soils: trace elements phytostabilization and carbon sequestration.	01/08/2016	Montpellier, France	Scientific community (higher education, Research)
AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	Interacciones árbol-suelo: aplicación a la fitorrecuperación de suelos contaminados por elementos traza.	01/02/2016	Madrid, Spain	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Post-fire soil erosion mitigation in Portugal.	10/05/2016	Aveiro.Portugal	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Influência da aplicação de mulching no restabelecimento das comunidades de invertebrados do solo em áreas ardidas.	13/06/2016	Coimbra, Portugal	Scientific community (higher education, Research) - Industry - Civil society - Policy makers
STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	How serious is subsoil compaction?	23/08/2015	Wageningen, Netherlands	Scientific community (higher education, Research)
STICHTING DIENST LANDBOUWKUNDIG ONDERZOEK	Subsidence and CO2-emissions of peat soils in agricultural use.	23/08/2015	Wageningen, Netherlands	Scientific community (higher education, Research)
UNIVERSIDADE DE AVEIRO	Predicting the effectiveness of different mulching techniques to reduce post-fire runoff and erosion in Mediterranean pine stands ? does cover matter?	17/04/2016	Vienna, Austria	Scientific community (higher education, Research)
THE CYPRUS INSTITUTE	Science-society cooperation for the maintenance	13/06/2016	Nicosia, Cyprus	Civil society



LIMITED	of Troodos agricultural terraced lands.			
UNIVERSIDADE DE AVEIRO	Medidas de Estabilização de Emergência Pós-fogo e a sua Avaliação Científica em Portugal. Seminário Caramulo, que Floresta no Futuro?	14/03/2015	Tondela, Portugal	Scientific community (higher education, Research)
AARHUS UNIVERSITET	2 presentations at Plantekongressen, by HCG Carstensen and M Lamandé	18/01/2017	Herning, Jutland, Denmark	Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias