



# AFTER-LIFE COMMUNICATION PLAN

EUTROMED PROJECT



**Demonstrative technique to prevent eutrophication caused by Nitrogen pollution  
from agricultural sources in surface water of Mediterranean climate zones.**

**LIFE+ 10/ENV/ES/511**

**Coordinator:**



**Associates:**



**Co-financier:**



**EUTROMED LIFE project aimed to demonstrate the effectiveness of a technology that works on one side, as a filter retaining nitrates and other nutrients of surface runoff, and on the other side, prevents erosion.**

In an area of 276 hectares, the treatment of 61 gullies with vegetal filters -systems consisting of biorolls, organic layers and nitrophilous plants- was carried out. Biorolls and layers are made of vegetable fibres (esparto and straw). Biorolls are placed perpendicular to lines of surface runoff on the slope, and layers are placed over the



**Example of bioroll and gabion with nitrophilous plants.**

bed of the gully (without vegetal cover). A number of flexible stone gabions are installed to secure the fixation of biorolls and layers, preventing them from being dragged away by water. In the backfill of biorolls, nitrophilous plants adapted to local conditions have been introduced, such as *Santolina chamecyparissus*, *Rosmarinum officinalis*, *Lavandula latifolia*, *Thymus mastichina* and *Thymus zyggis*.

A total of 69 farmers got involved in the EUTROMED project through the signing of voluntary agreements.

- \* **Allowing** the installation of biorolls, layers and gabions and promoting their conservation.
- \* **Receiving** counselling and implementing good agricultural practices.
- \* **Applying** the results of the software platform adapted for fertirrigation optimization of olive cultivation.



**Orcelis Fitocontrol software platform.**



**Gully treated with Model 3.**

With the use of the software platform Orcelis Fitocontrol- whose goal is to adapt fertilizer amounts to real needs of the plant, preventing excessive application- the use of nitrogen fertilizers was reduced by 32% during the fertilization campaign of 2014 compared to 2012.

#### PARTNERS OF THE PROJECT:

Granada City Council  
(coordinator).



University of Granada:  
Water Institute



Paisajes del Sur, S.L.



Bonterra Ibérica S.L.





At the same time, training seminars have been implemented addressing farmers, regarding topics related to olive cultivation and prevention of environmental problems such as nitrate pollution and soil erosion, very common issues in the zone of operation. Likewise, technical guides and dissemination material have been published and meetings for dissemination of results as well as exchange of experiences with other projects in different thematic forums have been carried out.

## A TECHNOLOGY EASY TO TRANSFER TO OTHER TERRITORIES.

**Widespread environmental problems: nitrate pollution of agricultural sources in surface waters and loss of fertile soil.**

- Solution to frequent environmental problems in semiarid zones of Mediterranean climate and sloping cultures.
- Installation of technology in gullies formed by the action of erosion on naked soils, without vegetal cover.
- Demonstrated effectiveness in nutrient filtration and erosion control.

### Use of local resources:

- Biorolls and layers manufactured using local vegetal fibres.
- Fixation elements built using stones and resistant meshes.

### Exportable methodology:

- Preventive measures, signing of voluntary agreements, selection of software platform for nitrogen fertilization, formation of target-groups.
- Corrective measures: installation and maintenance of technology in the field.
- Availability of practical guides for exportation.

## IMPORTANCE FOR EUROPEAN LEGISLATION.

The directive 91/676/CEE of the Council regarding the protection of water against nitrate pollution from agricultural sources, has as main goals the reduction of pollution caused by nitrates of agricultural origin, the elaboration of codes of good agricultural practices addressing the farmers, as well as the implementation of **action programmes** for the zones categorized as vulnerable and **control programmes** for the monitoring of their efficiency.

EUTROMED project has developed several actions regarding this goal, opting for the combination of preventive and corrective actions, implementing a very interesting technology to prevent nitrate pollution that can be exported to other territories of similar characteristics to LIFE+ EUTROMED project.



*Area of operation- EUTROMED project.*



Accordingly to monitoring data and analyses of the proposed technology, vegetal filters installed achieve reduction of nitrates by 60 %, phosphates by 50%, organic carbon by 20% and almost 50% of BOD<sub>5</sub> y QOD of surface runoff, retaining these nutrients and avoiding the pollution of recipient surface waters.

## RESULTS OF THE PROJECT.

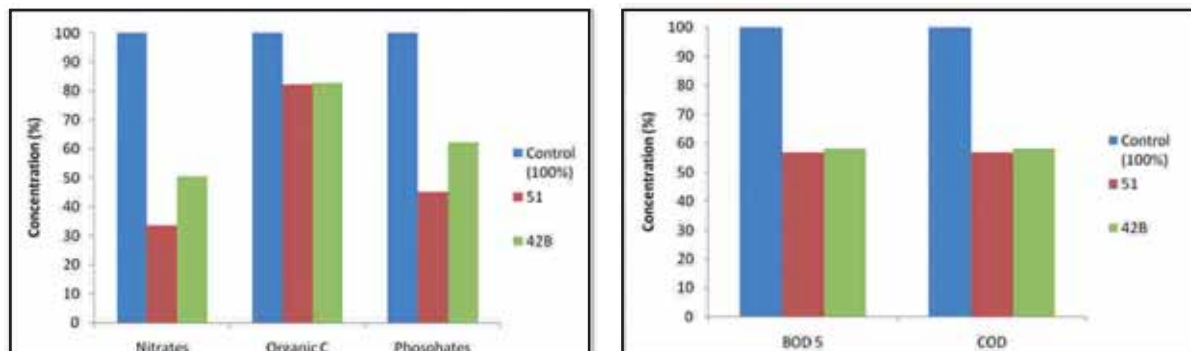


Diagram 1 and 2. Nutrient reduction in surface runoff - treated versus untreated gullies.

Besides, filters favour the development of vegetal cover, obtaining an increase of 4,9 t/ha of biomass in treated parcels compared to untreated parcels throughout the project. At the same time, results point the fact that filters reduce soil loss by 150% compared to untreated gullies.

A very significant result has been the reduction in nitrate concentration observed in the Juncarón stream, where surface runoff is discharged from both treated slopes, reflecting a global result on a sub-basin level.

Sampling points (December 2013)	Nitrates (mg/l)	Phosphates (mg/l)	Carbon organic (mg/l)
Juncarón half	85,54	3,53	50,40
Juncarón end	74,86	1,84	62,61
Sampling points (October 2014)	Nitrates (mg/l)	Phosphates (mg/l)	Carbon organic (mg/l)
Juncarón beginning	32,75	4,29	20,53
Juncarón half	34,96	0,63	41,87

Tables 1 and 2. Nutrients concentration in the Juncarón stream after analysis performed in december 2013 and october 2014.

Considering the values obtained in "Juncarón half" presented in the tables above, it is shown that the set of preventive and corrective actions have succeeded in the reduction of nitrate concentration in the stream by 60%.

### Other results obtained were:

- Selection and adaptation of a software platform for optimization of nitrogen fertirrigation, achieving a reduction of 32% the amount of fertilizer used in olive groves in the zone of operation.
- Signing of 69 individual Voluntary Agreements with farmers.
- Publishing of 4 practical guides to transfer this experience to other territories.
- Awareness of farmers, owners and public regarding the principles of Territory Stewardship, good agricultural practices, prevention of nitrate pollution, erosion control and sustainable use of resources.

Continuous and progressive communication of advancements of EUTROMED Project through different means, added to the publication of technical material and organization of dissemination workshops, have allowed the involvement of target groups in Project actions, such as stakeholders and general public, regarding the effectiveness of biorolls in nitrate filtration and erosion control.

## COMMUNICATION STRATEGY.

### Summary of activities carried out:

- **Website implementation.** Description of developments carried on, dissemination events, registration in workshops, publication of scientific-technical newsletters, practical guides and other material.
- **Notice boards.** Dissemination of the Project developments and events in 4 notice boards place in Granada City Council and Deifontes, Albolote and Iznalloz municipalities.
- **Workshops of Introduction addressing target groups (mainly farmers):**
  - Deifontes, briefing and fieldtrip.
  - Agricultural Cooperative San Isidro de Deifontes.
  - Cooperative Varaila of Domingo Perez.
  - Plenary Hall- Deifontes.
- **Dissemination workshop EUTROMED Project addressing general public (technicians, administrations, universities, environmentalists):**
  - Intermediate, April 2013. Granada City Council.
  - Final, March 2015. Granada City Council.
- **Training seminars addressing target groups (Deifontes, Iznalloz and Albolote):**
  - Study of soil and its quality (3 sessions).
  - Water resources and their use (2 sessions).
  - Denitrification and nitrogen cycle (2 sessions).
  - Technique and materials for erosion control and reduction of eutrophication in runoff surface waters in olive groves. (2 sessions).
- **Dissemination workshop "Good agricultural practices for erosion control in olive groves".**



*EUTROMED website.*



*Bulletin board in the headquarters of Granada City Council.*



*Dissemination Workshop held in Granada.*



*Workshop addressing farmers in Deifontes.*

## COMMUNICATION STRATEGY.

### ■ Publication of dissemination material:

- Digital newsletter: introduction to the project.
- 500 project brochures for the signing of Voluntary Agreements with farmers.
- 100 leaflets about training seminars.
- 200 leaflets: Intermediate Briefing Programme.
- 150 booklets "Intermediate Shortguide- LIFE EUTROMED Project".
- 300 brochures "vegetal covers in olive groves".
- 100 dossiers "basic advice for farmers involved" with information about biorolls conservation, management of vegetal cover and Nitrogen fertilization.
- 200 leaflets of the Final Briefing Programme.
- 200 booklets "Final Shortguide of LIFE EUTROMED project".
- 60 training guides for farmers.
- 300 guides "Guide of good agricultural practices against nitrate pollution".
- 100 guides "Guide for the use of software platform Orcelis Fitocontrol".
- 200 CD with above mentioned guides in English and Spanish.
- 200 "Methods guide for installation and manufacture of biorolls".
- 200 CD with 4 published guides.
- 150 booklets "Layman Report".



*Practical Guides published.*



*CD including practical guides in pdf.*



*Dissemination brochures.*



*Shortguides handed out in the dissemination sessions.*

### TECHNICAL COMMUNICATIONS AND PUBLICATIONS:

- Scientific-technical Newsletter nº 1.
- Poster at local CONAMA 2011.
- Scientific-technical Newsletter nº 2.
- Scientific-technical Newsletter nº 3.
- Communication at VI CICES 2012.
- Scientific-technical Newsletter nº 4.
- Communication at CONAMA 2012.
- Article to REDIAM Magazine Janeiro 2013.
- Scientific-technical Newsletter nº 5.
- Scientific-technical Newsletter nº 6.
- Communication at Congreso SEFIN September 2013.
- Communication at Hydrogeology Congress October 2013.
- Poster at Local CONAMA 2013.
- Scientific-technical Newsletter nº 7.
- Communication EC'14 Nashville (Tennessee) February 2014.
- Scientific-technical Newsletter nº 8.
- Scientific-technical Newsletter nº 9.
- Scientific-technical Newsletter nº 10.
- Communication at CONAMA 2014.
- Communication at VII CICES 2014.
- Communication at Congress of Bioengineering and Green Infrastructure 2014.
- Scientific-technical Newsletter nº 11.
- Scientific-technical Newsletter nº 12.

## ADDITIONAL DISSEMINATION ACTIVITIES.

WHAT	WHEN	HOW	BUDGET								
Website	5 years	<p>Granada City Council (DIPGRA) will be responsible for its maintenance during the following 5 years after the finalization of the Project. All published materials will be available in the website: newsletters, leaflets, booklets practical guides, Layman report, etc.</p> <p>To keep the dynamics, partners will periodically update information regarding activities and events organized after the Project and related with it, under DIPGRA's coordination. In the websites of every partner (DIPGRA, UGR, BTI y PSUR) direct links to EUTROMED website will be posted.</p> <p>An average of 3.000 monthly visits is expected.</p>	<p><b>0 €</b></p> <p>(already included in website)</p>								
Database of target groups	5 years	Granada City Council (DIPGRA) will be recipient of the database of target groups and identified stakeholders of the project, and it will contact them when workshops are implemented, as well as other activities related with the Project goals.	<p><b>0 €</b></p> <p>(expenditure management of other projects)</p>								
Practical guides, manuals and dissemination material	5 years	<p>Electronic versions will be available in the website <a href="http://www.eutromed.org">www.eutromed.org</a></p> <p>During the development of the Project the publication of a number of guides in paper and CD has been scheduled; the material will be available in the headquarters of Granada City Council (DIPGRA) after the finalization of the Project: they will be sent to any institution requesting for them. They will also be distributed in seminars and congresses of topics related where the Department of Environment participates. Electronic versions will be always available. All material will be available in Spanish and partially in English.</p>	<p><b>0 €</b></p> <p>(material already available without further costs)</p>								
Dissemination through networks	5 years	<p>Networks formed throughout the Project will continue connected after its end, since their partners play active roles in most of them, and will continue promoting and participating in the dissemination of experiences in different forums.</p> <table border="1"> <thead> <tr> <th>Partner</th><th>DIPGRA</th><th>UGR</th><th>PSUR and BTI</th></tr> </thead> <tbody> <tr> <td><b>Organizations where it is integrated, or keep networks with.</b></td><td> <b>GRAMAS Network</b> (Granadian municipalities for sustainability).  <b>CONAMA</b> Foundation. </td><td> <b>Water Institute (Instituto del Agua)</b>  <b>SEFIN</b> (Spanish Society for Nitrogen Fixation). </td><td> <b>IECA</b>, International Erosion Control Association.  <b>AAEF</b>, Andalusian Association of Forest Enterprises  <b>AEAC.SV</b>, Spanish Agricultural Association of Live Soil Conservation  <b>AEIP</b>, Spanish Association of Landscape Engineering. </td></tr> </tbody> </table>	Partner	DIPGRA	UGR	PSUR and BTI	<b>Organizations where it is integrated, or keep networks with.</b>	<b>GRAMAS Network</b> (Granadian municipalities for sustainability). <b>CONAMA</b> Foundation.	<b>Water Institute (Instituto del Agua)</b> <b>SEFIN</b> (Spanish Society for Nitrogen Fixation).	<b>IECA</b> , International Erosion Control Association. <b>AAEF</b> , Andalusian Association of Forest Enterprises <b>AEAC.SV</b> , Spanish Agricultural Association of Live Soil Conservation <b>AEIP</b> , Spanish Association of Landscape Engineering.	<p><b>0 €</b></p> <p>(expenditure expenses of other projects)</p>
Partner	DIPGRA	UGR	PSUR and BTI								
<b>Organizations where it is integrated, or keep networks with.</b>	<b>GRAMAS Network</b> (Granadian municipalities for sustainability). <b>CONAMA</b> Foundation.	<b>Water Institute (Instituto del Agua)</b> <b>SEFIN</b> (Spanish Society for Nitrogen Fixation).	<b>IECA</b> , International Erosion Control Association. <b>AAEF</b> , Andalusian Association of Forest Enterprises <b>AEAC.SV</b> , Spanish Agricultural Association of Live Soil Conservation <b>AEIP</b> , Spanish Association of Landscape Engineering.								



WHAT	WHEN	HOW	BUDGET
Attendance to fairs, seminars and congresses	5 years	<p>Partners will continue their participation in fairs, workshops and congresses related with nitrate pollution and erosion control. In those events where there is a demonstration tent available, roll-up and technology models will be shown to public. Posters and communications will be prepared about EUTROMED project, as example of good practice.</p> <ul style="list-style-type: none"> <li>• BTI and PSUR usually participate in Iberflora (Valencia), Expoliva (Jaén), Congresses of IECA, AEIP, AAEF, AEAC.SV. The most immediate is the II CIREF (Iberian Congress of Forest restoration) programmed in Pamplona- June 2.015.</li> <li>• UGR intervenes in SEFIN Congresses and other technical-scientific forums related with water. XV SEFIN will be celebrated in León (Spain) during June 2.015. The results of the Project will be presented.</li> <li>• DIPGRA coordinates GRAMAS Network, and participates in CONAMA as well as forums related with water management.</li> </ul>	<p><b>0 €</b></p> <p>(management expenditures for other projects)</p>
Layman Report	5 years	<p>The pdf version of Layman report will be available in the website <a href="http://www.eutromed.org">www.eutromed.org</a>. I will be available to all stakeholders and a paper copy will be delivered to every target group of the project. DIPGRA will send copies to every entity requesting for them. The report will be available in English and Spanish versions.</p>	<p><b>0 €</b></p>
Briefing about the results in the zone of operation	1 year	<p>A meeting will be convened with target groups to expose the results of the Project and promote the engagement with good agricultural practices against nitrate pollution and for the maintenance of vegetal cover among farmers.</p> <p>San Isidro Cooperative - entity involved with the project - will participate with farmers individually. It will be convened during the first year after the end of the Project taking advantage of the software platform for the fertilization campaign (licensed paid until 2015) with very good results in previous years.</p> <p>Also, administrators from the agricultural branch ( Secretary of Agriculture and Fisheries) and water management (CHG) will be called to demonstrate the experience and results obtained.</p>	<p><b>0 €</b></p> <p>(with participating partners - place of meeting will be provided by the Cooperative or Municipality)</p>
Announcement- Zerosion WoMan Awards	5 years	<p>Awards organized by PSUR and BTI to acknowledge projects and people working in erosion control. In June 2015 Jesus Gonzalez will be awarded -a member EUTROMED project-, with the purpose of disseminate the project.</p>	<p><b>0 €</b></p>
Implementation of a new cycle of LIFE project	1 year	<p>The goal is to prepare a new proposal to allow the continuation EUTROMED, emphasizing in the prevention of nitrate pollution and introducing a new technology for the elimination of nitrates present in drinking water.</p>	<p><b>0 €</b></p> <p>(management expenses of participant partners)</p>





## PARTNERS OF THE PROJECT

### Coordinator Partner:

#### Diputación Provincial de Granada

Servicio de Medio Ambiente  
c/ Periodista Barrios Talavera, 1  
18071 Granada  
Phone: 958 24 72 76  
Fax: 958 24 78 69  
e-mail: jgarcia@dipgra.es

### Beneficiary Partners:

#### Universidad de Granada

Cuesta del Hospicio, s/n  
18071 Granada  
Phone: 958 24 41 70  
e-mail: jgl@ugr.es

#### Bonterra Ibérica S.L.

Poligono Juncaril,  
c/ Bubión. Nave 30.  
18210 Peligros, Granada  
Phone: +34 902 200 502 / + 34 958 172 820  
Email: info@bonterraiberica.com

#### Paisajes del Sur S.L.

Poligono Juncaril,  
c/ Bubión. Nave 30.  
18210 Peligros, Granada  
Phone: +34 902 200 502 / + 34 958 172 820  
Email: info@paisajesdelsur.com



### Project term:

From September 1st, 2011 to April 30th, 2015.

#### Coordinator:



#### Associates:



Universidad  
de Granada



paisajes  
del sur



#### Co-financier:

