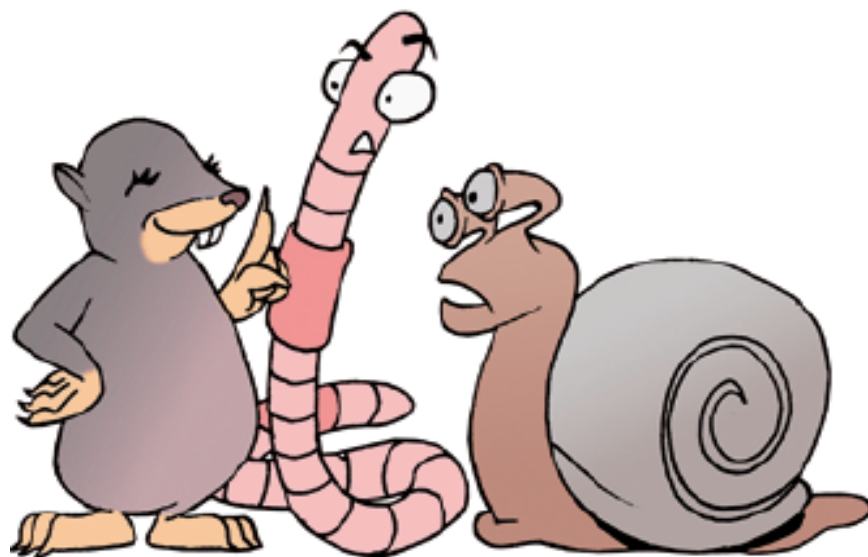


"LIVING IN THE SOIL": AN INNOVATIVE AND ATTRACTIVE COMIC TO KNOW THE SOIL



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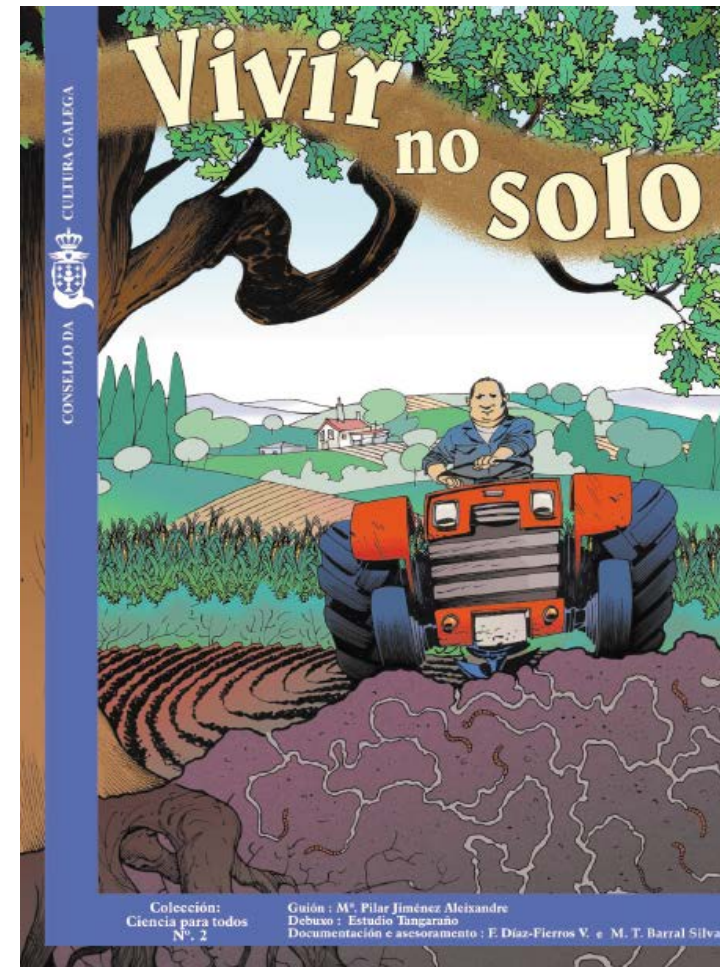
Script: M^a. Pilar Jiménez Aleixandre
Illustration: Estudio Tangaraño
Documentation and scientific advice: M. T. Barral Silva and F. Díaz-Fierros V.



BACKGROUND

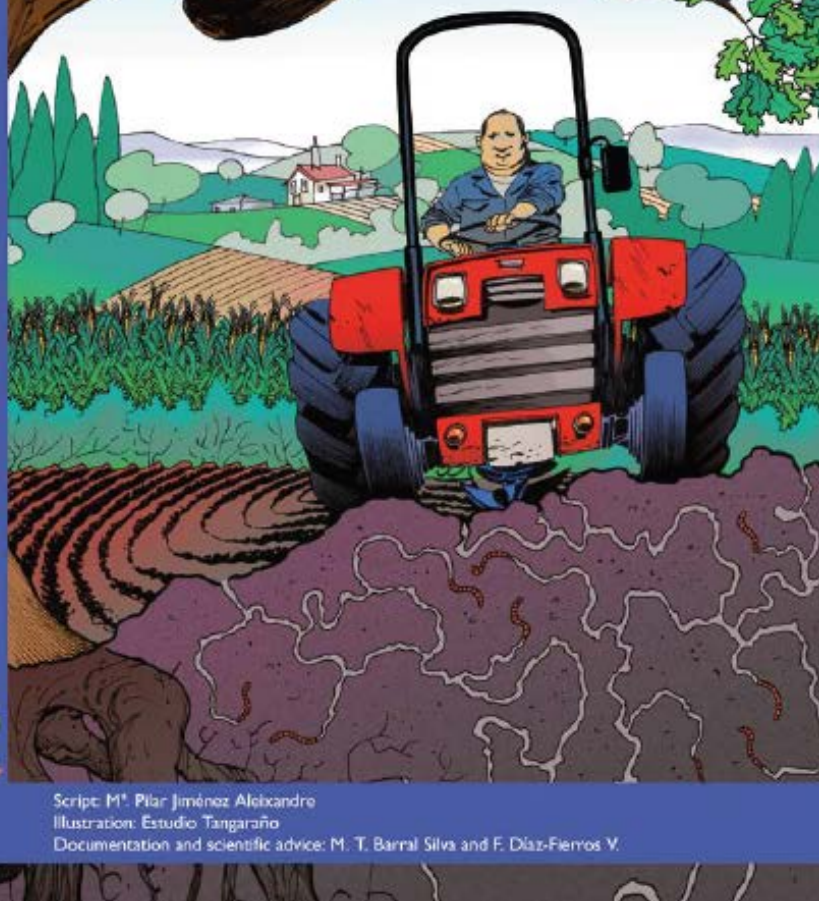
Initially, in most soil studies only the inorganic fraction was considered: physical and chemical properties, processes, formation, classification, etc. **Soil studies related to the organic matter** (5% of the total soil composition) **were scarce**

In 1980, the **“Soil Biochemistry Department”** was created in the IIAG-CSIC (Santiago de Compostela, **NW Spain**). Main research interest was focussed on organic matter fraction: composition and dynamics, characteristics (biomass, activity, diversity) and the role of microorganisms (cycles of C and nutrients, degradation and immobilization of toxic compounds..). **The biological properties were always included**, in addition to the physical and chemical ones, in the soil characterization. Results showed the importance of soil organisms, particularly microorganisms, in soil functioning



Since 1980, **“The concept of soils as a living ecosystem”** was considered by the Spanish Soil Researchers. In 2000, the comic **“Vivir no solo”** was elaborated in Galician language by the Consello da Cultura Galega. In the 90 Decade (17-20 years later), **“The concept of soil quality”** –including biological properties-and **“The concept of soil living system”** were introduced at international level

Living in the soil



Script: M^a Pilar Jiménez Aleixandre
Illustration: Estudio Tangaraño
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The soil is a hidden resource very little known to the general public. It is under our feet, but it is not seen because it is covered by vegetation. However, **agricultural or forest soil is a living system, it is the home to a huge diversity of organisms of different sizes that perform important ecological functions and others linked to human activities**

Comic “Living in the soil “ (2015)

Script: MP Jiménez Aleixandre

Illustration: Estudio Tangaraño

Documentation and scientific advice: MT Barral, F Díaz-Fierros

English translation and adaptation: MT Barral, M Díaz-Raviña, F Díaz-Fierros

Coordination: M Díaz-Raviña (IIAG-CSIC, SECS-Galicia)

Entities: Spanish Society of Soil Science (SECS-Territorial Delegation of Galicia), Consello da Cultura Galega and the University of Santiago de Compostela

COMIC PROJECT

To commemorate the “2015 International Year of Soil” with the aim of raising awareness amongst young people the importance of soil and the need to protect it



The comic is based in the “*concept of soil as a living system*”

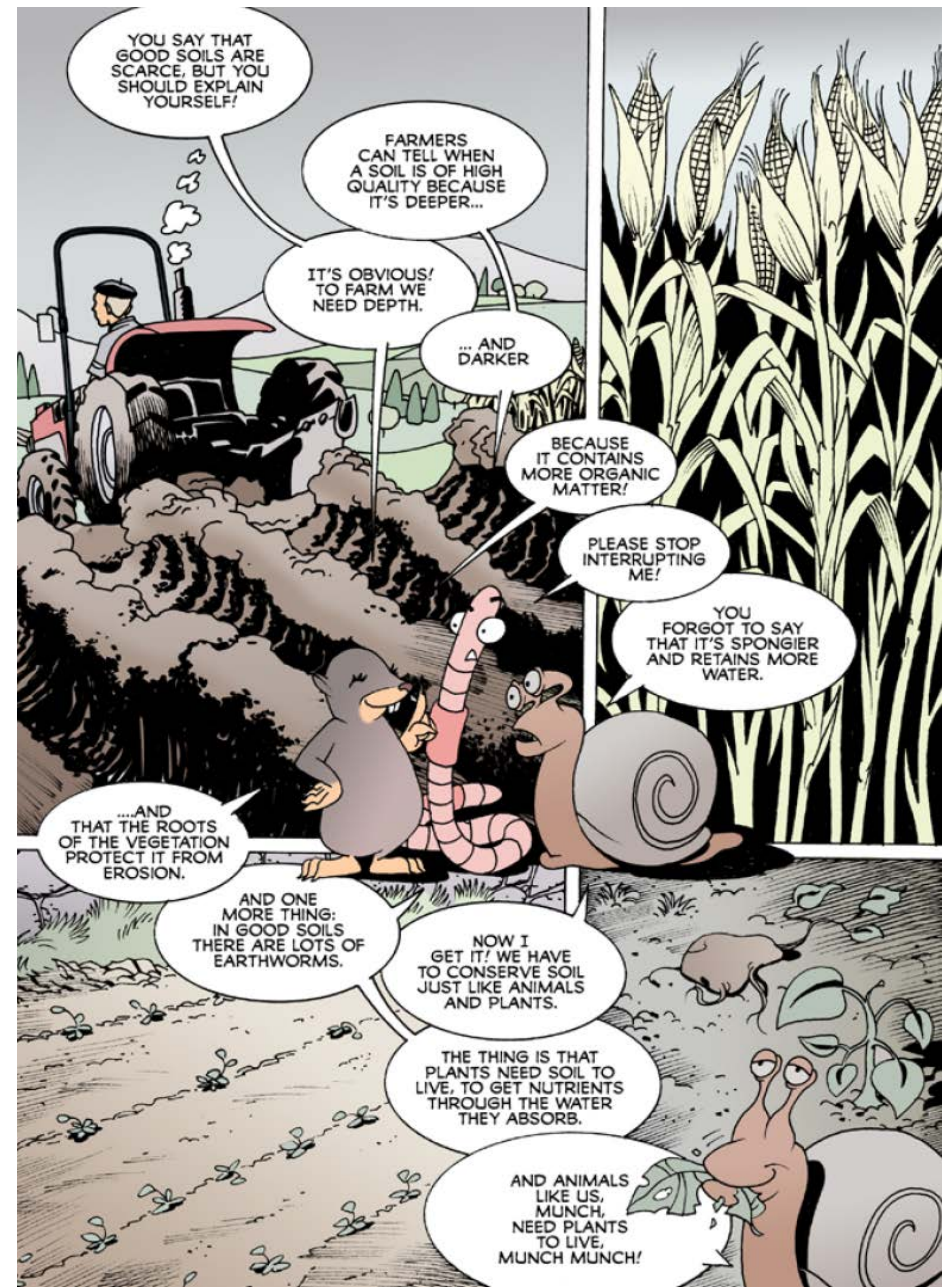
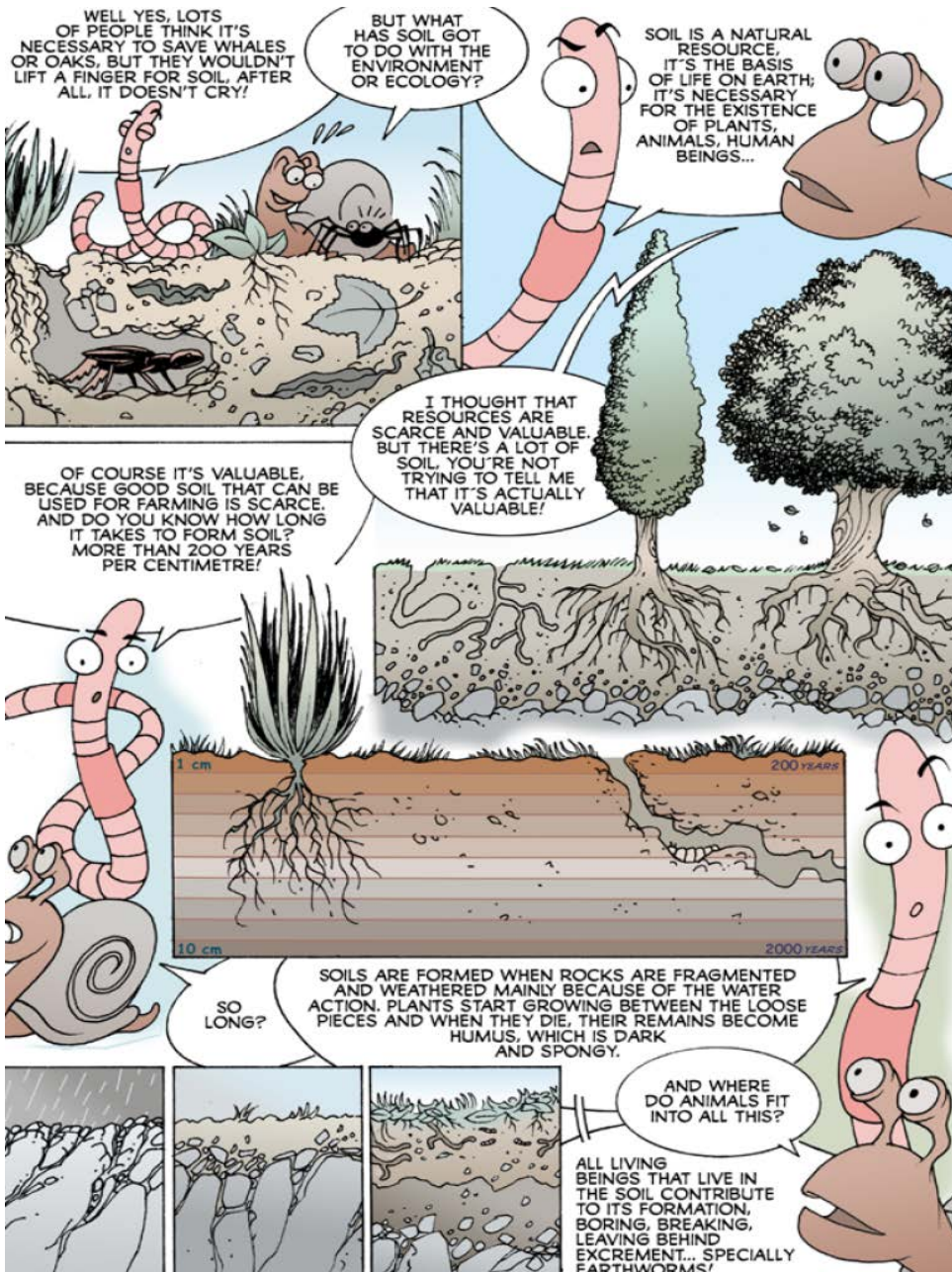
The protagonists of the comic “*Living in the soil*” are a snail, an earthworm and a mole that inhabits the soil as well as a group of young people working in the town hall who, trying to solve a problem of soil use management that occurs in a little village, show us several important soil aspects (concept, components, functions, threats, degradation, protection and restoration) to allow us to consider its importance to the maintenance of life in the planet



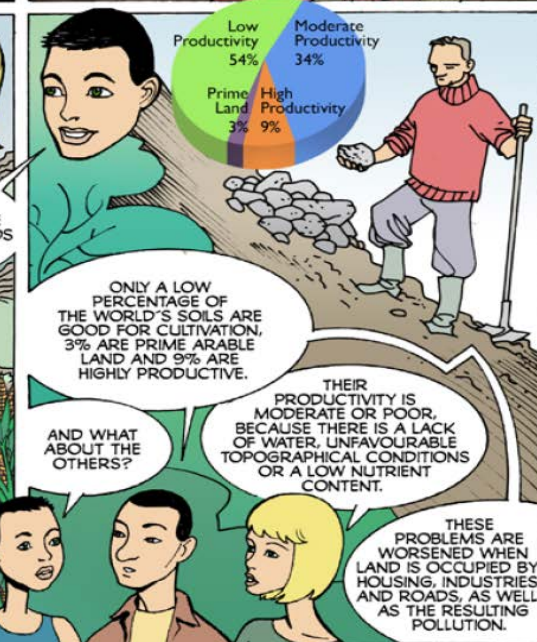
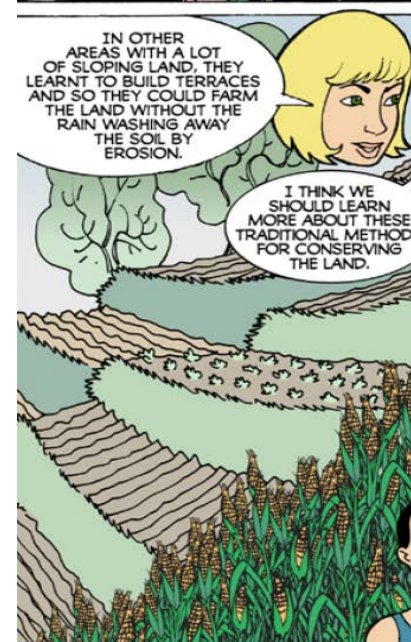
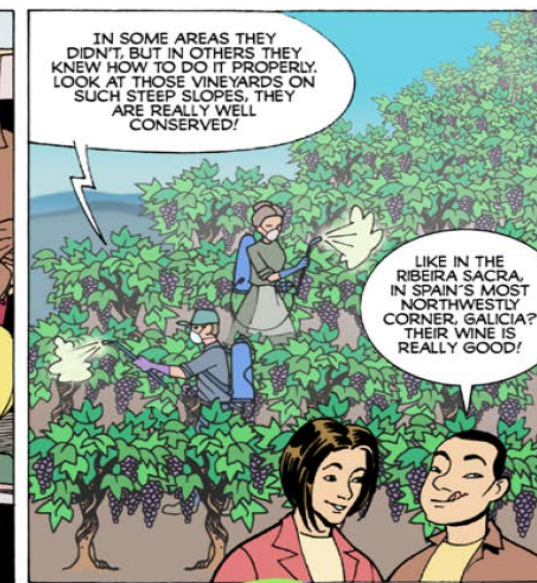
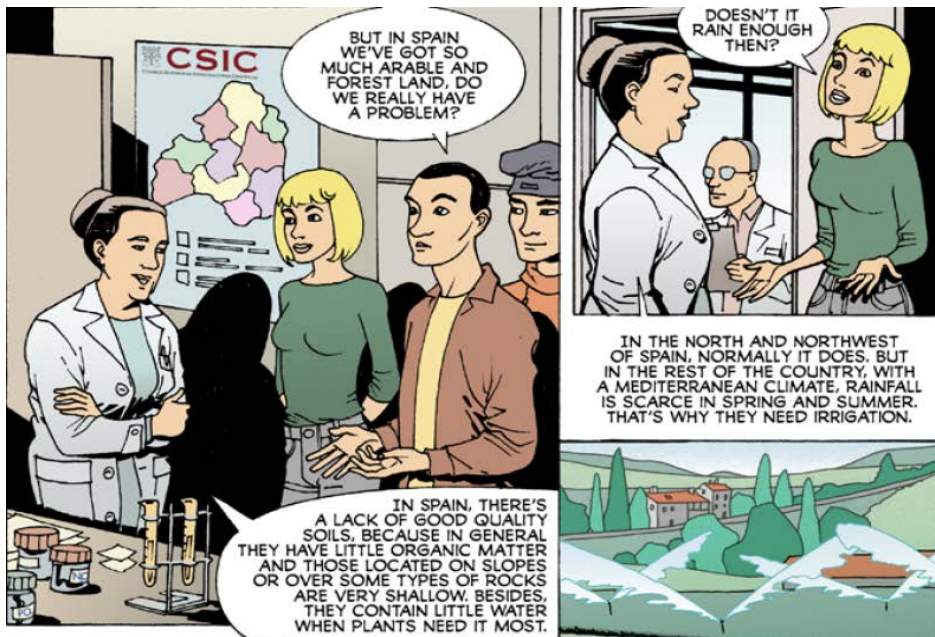
Problem: A dispute between two neighbours of a village because one of them wants to build a house in an agricultural soil

The mayor requires the services of the protagonists of the comic to find reasons to solve this controversial issue and avoid thus do not lose the elections

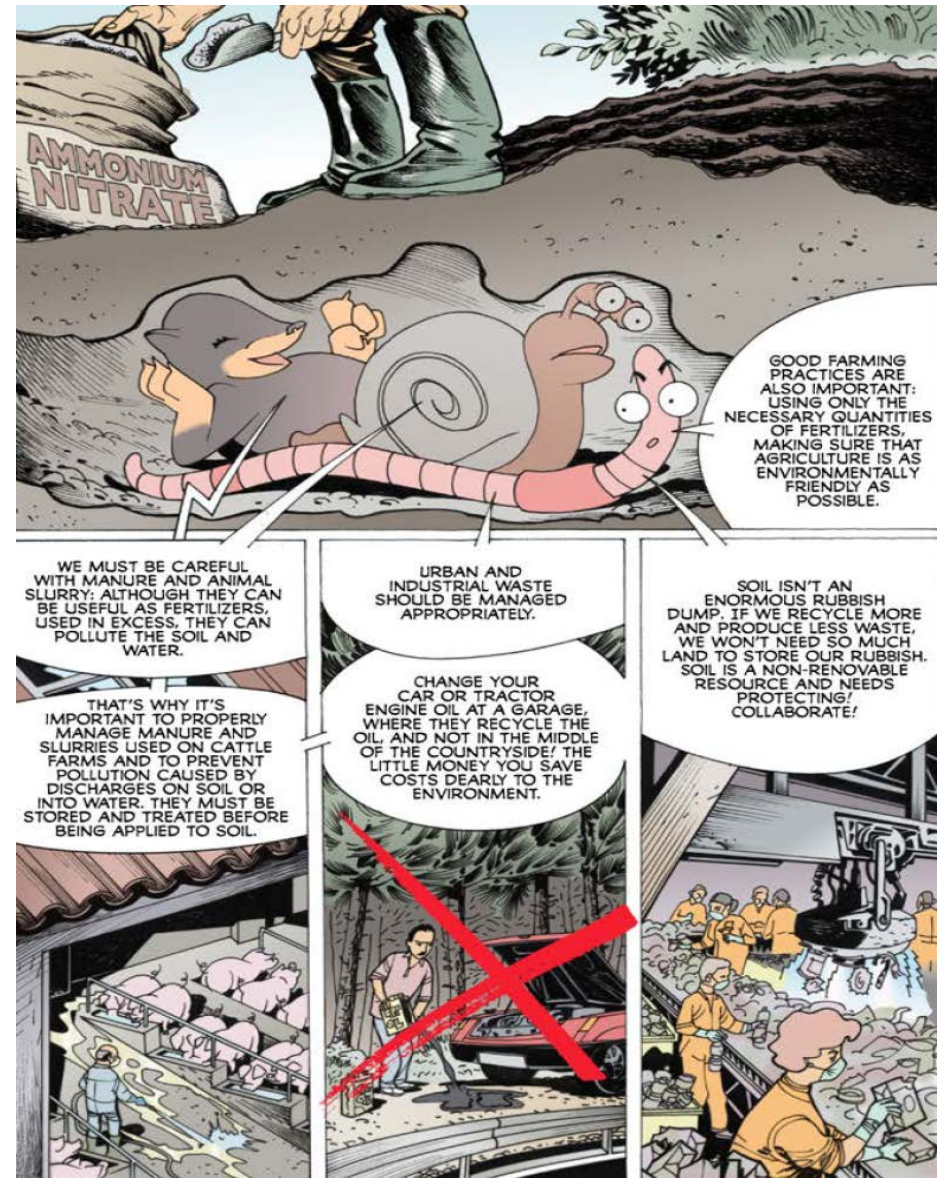
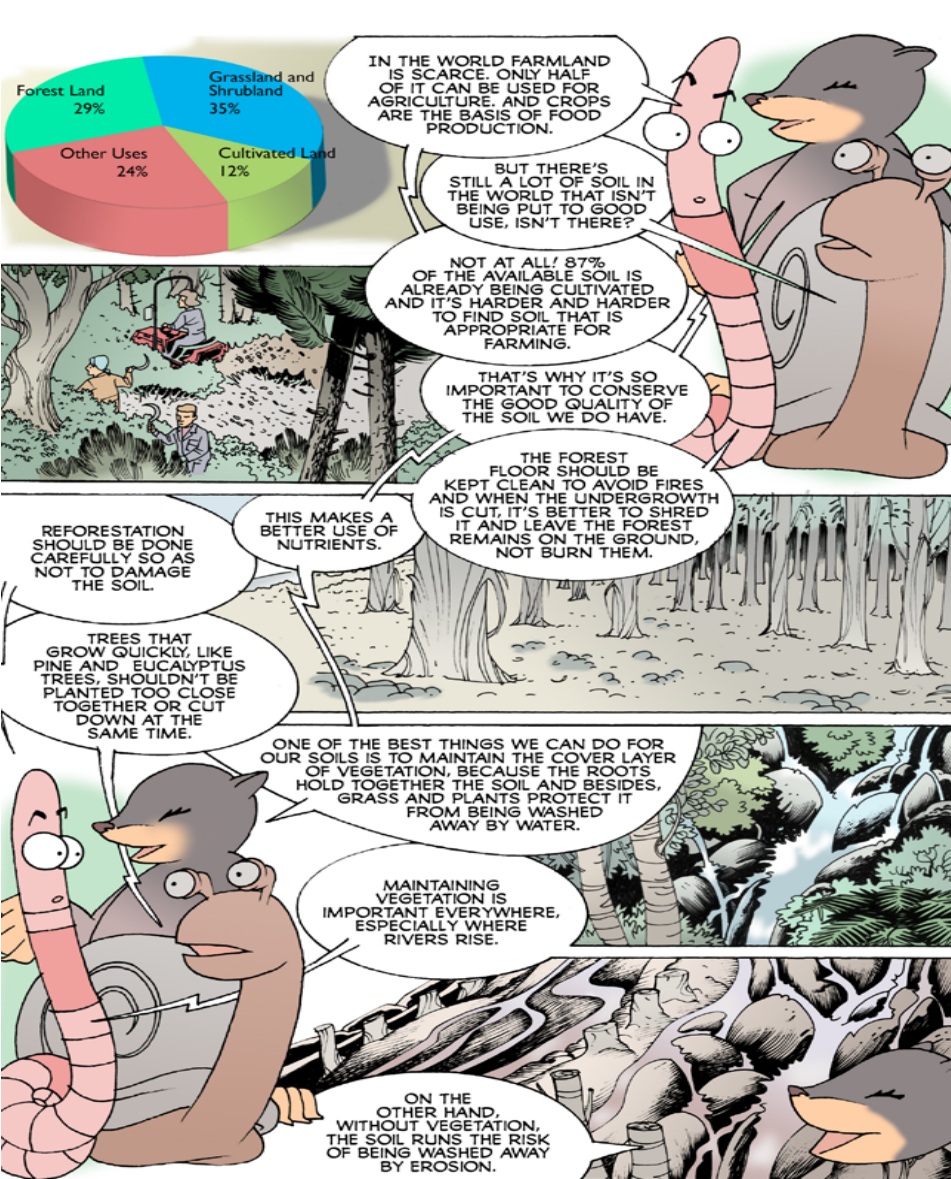
The snail, the earthworm and the mole talk about the importance of soil (formation, functions and the need to protect it). They don't understand how people save whales or other animals in danger, but they do not anything to save the living soil system

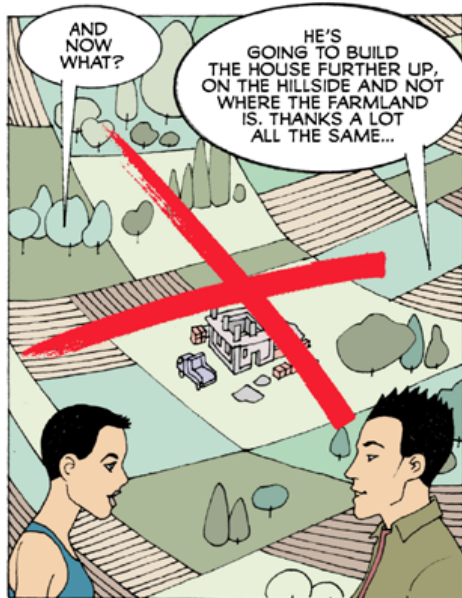
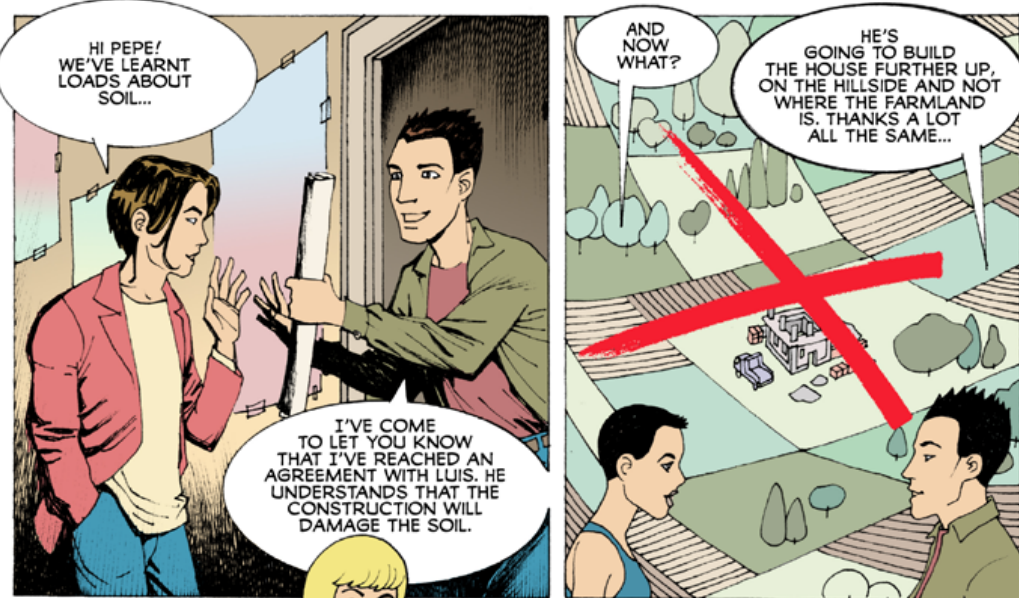


The group of young people interview to a soil Researcher in order to know the actual state of art of soils (quality and productivity of soils, factors determining and limiting them, the importance of adequate soil use management, etc.) and afterwards, they collected all this information and do an analysis about all these soils aspects in their village/country



The snail, the earthworm and the mole talk about the serious state of soil degradation with the corresponding loss of soil quality and functions and thus the need to implement adequate forests and agricultural conservation practices (reforestation with adequate tree specie, keep vegetation residues on the soil surface, implantation of a vegetation cover to avoid erosion, optimization of the use of organic manures and agrochemical products, avoid the use of soil as a rubbish dump). They ask our help to save this living system, to save them





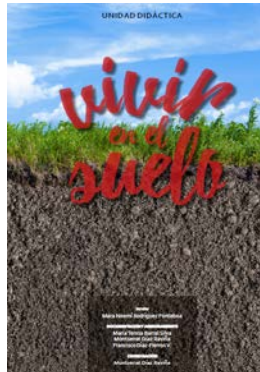
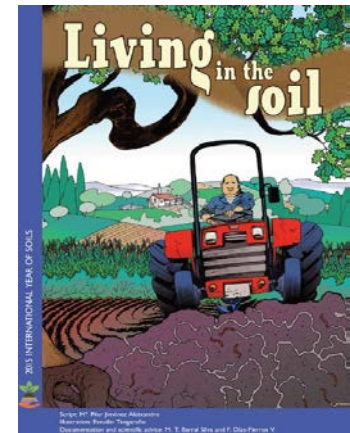
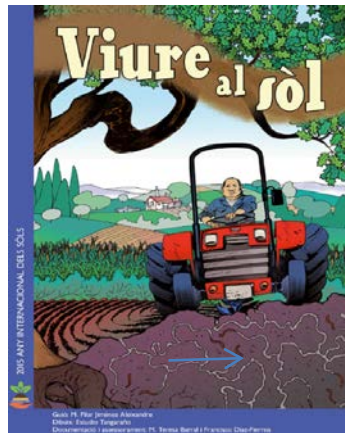
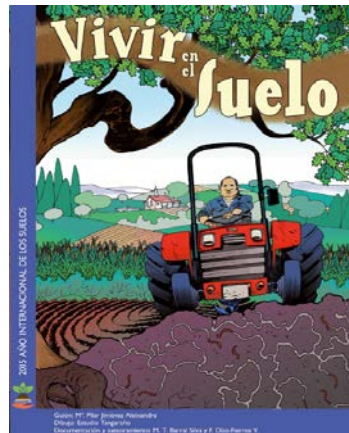
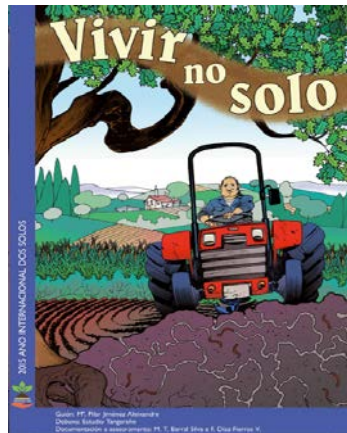
After the report of the group of young people, the dispute between the two neighbours is solved and the house is going to build further upon the hillside and not in the agricultural land

i So, a happy end iii

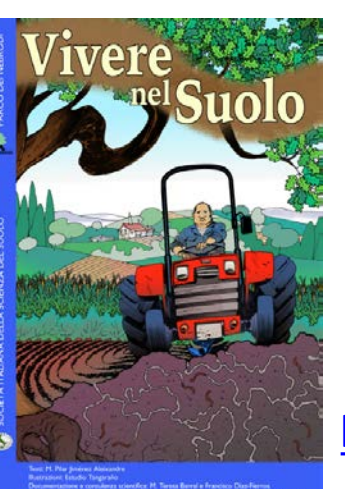
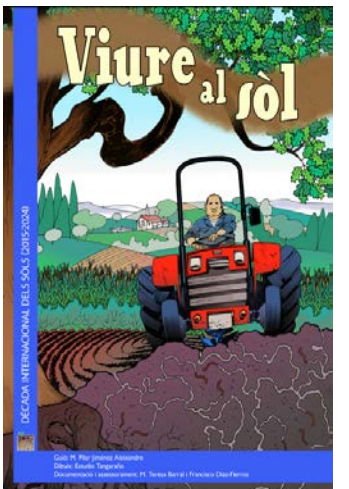
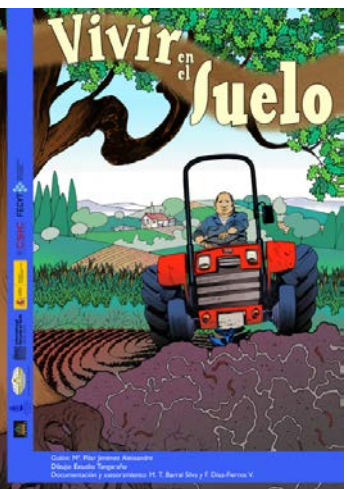
After collecting all this information about the soil importance to the maintenance of life on the planet and the state of the art on this topic (serious threats, scarce of soil quality and productivity and consequent soil degradation), the young people decide to write the comic "Living in the soil" with the aim of raising awareness amongst young people the importance of soil and the need to protect it

.....and they lived happily iii

COMIC PROJECT



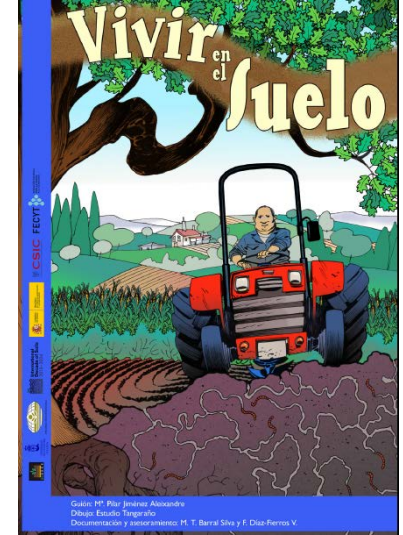
2015-2016, to commemorate 2015 International year of Soils, the previous Galician comic (2000) was adapted and translated in 5 different languages (Galician, Spanish, Catalan, Italian and English) and the corresponding Plan Lessons were also elaborated (Spanish, Galician, English)



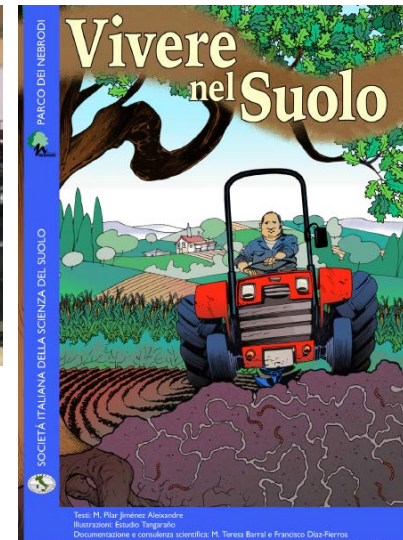
2018-2019, to commemorate the 2015-2024 Decade International of Soils, the comic was re-edited in 3 languages (Spanish, Catalan and Italian languages)

<http://www.secs.com.es/publicaciones/>

COMIC PROJECT: Since 2015 up to now the comic has been used in many activities/projects carried out in many institutions (educational centers, museums, natural parks, nature associations, etc.) that have been a great success eg. “Vivir en el suelo, Would be possible the life in the planet without the soil?” (SECS, CSIC), “Vivere nel Suolo: Giornata di Legalità Ambientale” (SECS, SISS, Parco dei Nebrodi,... (around 80.00 printed copies were used in these events)

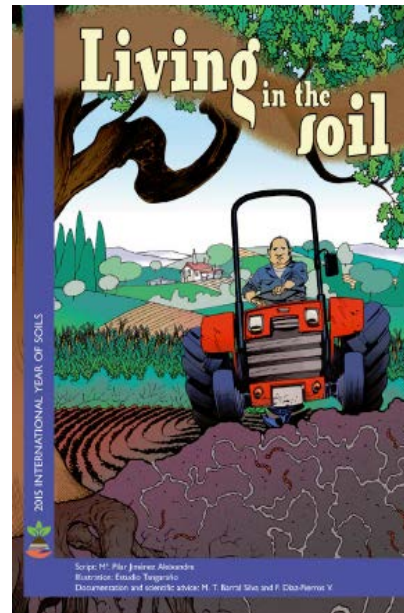


“Would be possible the life in the planet without the soil?” conference based in the comic “Vivir en el suelo” given in many different Educative Centers of Spain (Project “Ciudad Ciencia”, CSIC, Spain)



“Vivere nel suolo: Giornata di Legalità Ambientale”, Parque dei Nebrodi, Sicilia, Italia

OTHER INITIATIVES: PRESENCE OF A PERMANENT SOIL ROOM AND THE COMIC IN THE MUSEUMS



Since the soil is a living system, therefore it is included in the geodiversity section together with the mineral, rocks, fossils and meteorites

Soil biodiversity

http://www2.usc.es/export9/sites/www2/museohn/descargas/planta_PRIMEIRA_xeodiversidade_e_solo.pdf

The permanent soil room is one of the most interesting for visitors to the museum. The museum receives around 35,000 visitors, from different sectors of society, per year. Therefore, **museums** are an excellent platform to give visibility to the soil

OTHER INITIATIVES: TEMPORAL EXHIBITION IN THE MUSEUM OF NATURAL HISTORY (USC)

"SOIL-ART: PAINTING WITH SOILS. Pictures of José Caballo"



Aim: to know the soil throughout the painting

This innovative and attractive exhibition, that combines science and art, took place in the MHN (USC), included:

- 36 paintings of different themes such as landscapes, villas, villages and reproductions of pieces of cultural heritage (prehistory and middle ages)

- "The corner of the painter", with an explanatory panel of the process of elaboration of the paintings and the material used in them

- Two videos "Soils and Colors" and "Components and Color of the Soil"

- A series of showcases in which the variation of color in the minerals of the soil is presented, the colors of the samples of the horizons C used in the elaboration of the geochemical map of Galicia (NW Spain), the diversity of colorations of the horizons A, B and C of soil and color variation in 4 representative soil profiles of Galicia (Podzol, Umbrisols and Andosol)

Through these different exhibition elements (pictures, scientific aspects), the most relevant aspects of the diversity and origin of the soil colors and how they were used by the artist in his compositions of such diverse themes were shown. During 6 months received around 15.000 visitors

OTHER INITIATIVES: “THE SOIL GAME”, playing and learning about the soil



This is a teaching material aimed at the general public, and especially to students of different educational levels (children, teenagers and adults) and which, following a similar dynamic to the “Goose Game”, seeks to transmit basic notions on the soil, as well as to raise awareness among participants of the importance of its protection and its correct management

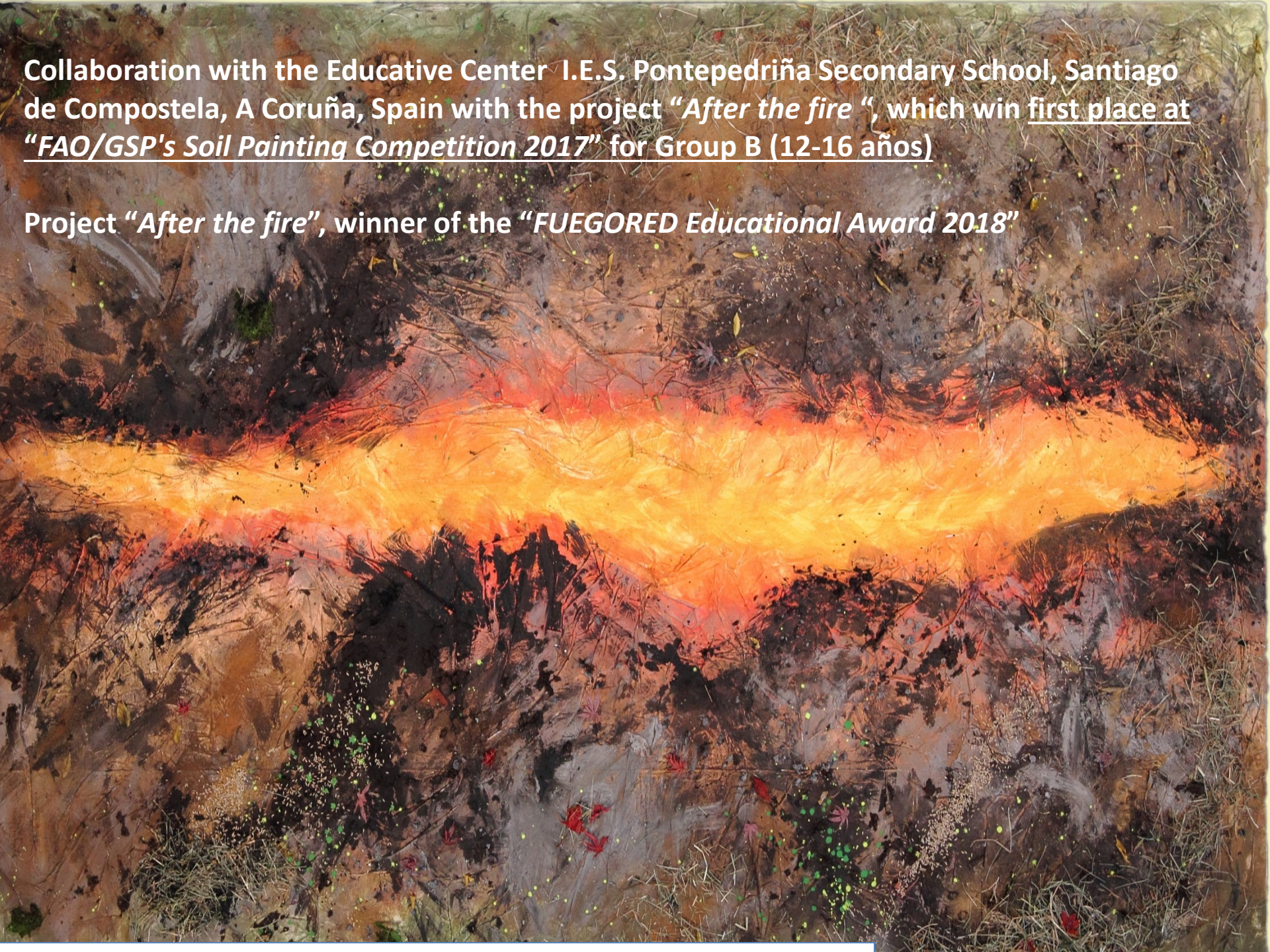
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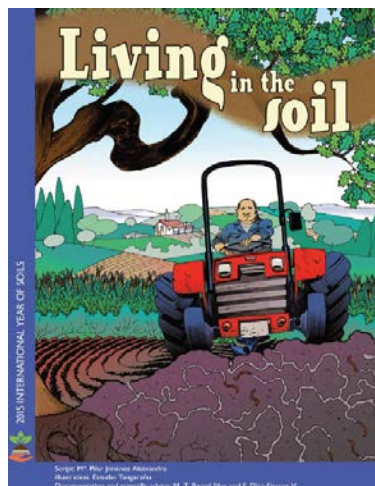
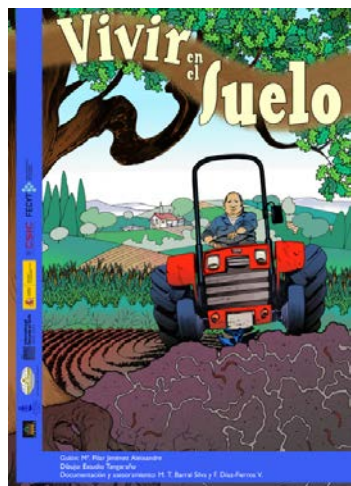
Collaboration with the Educative Center I.E.S. Pontepedriña Secondary School, Santiago de Compostela, A Coruña, Spain with the project *"After the fire "*, which win first place at "FAO/GSP's Soil Painting Competition 2017" for Group B (12-16 años)

Project *"After the fire"*, winner of the *"FUEGORED Educational Award 2018"*



THE COMIC PROJECT STILL IS GOING ON DURING THE 2015-2024 DECADE OF SOILS

JOIN US TO THIS PROJECT TO DISSEMINATE THE COMIC “LIVING IN THE SOIL” AT NATIONAL AT INTERNATIONAL LEVEL AND RAISE AWARENESS AMONG YOUNG PEOPLE ABOUT THE IMPORTANCE OF SOIL AND THE NEED TO PROTECT IT



The Spanish and the English versions have a great potential to reach this objective

WE CAN TO RE-EDITED THEM!

DISSEMINATE THE COMIC IN THE DIFFERENT SCENARIOS THAT IT CAN BE CONCERNED IN:

-WEB FORMAT

-PRINTED FORMAT BY THE RE-EDITION OF THE REQUIRED VERSION IN COLABORATION WITH THE TERRITORIAL DELEGATION OF SPANISH SOCIETY OF SOIL SCIENCE (SECS-GALICIA)

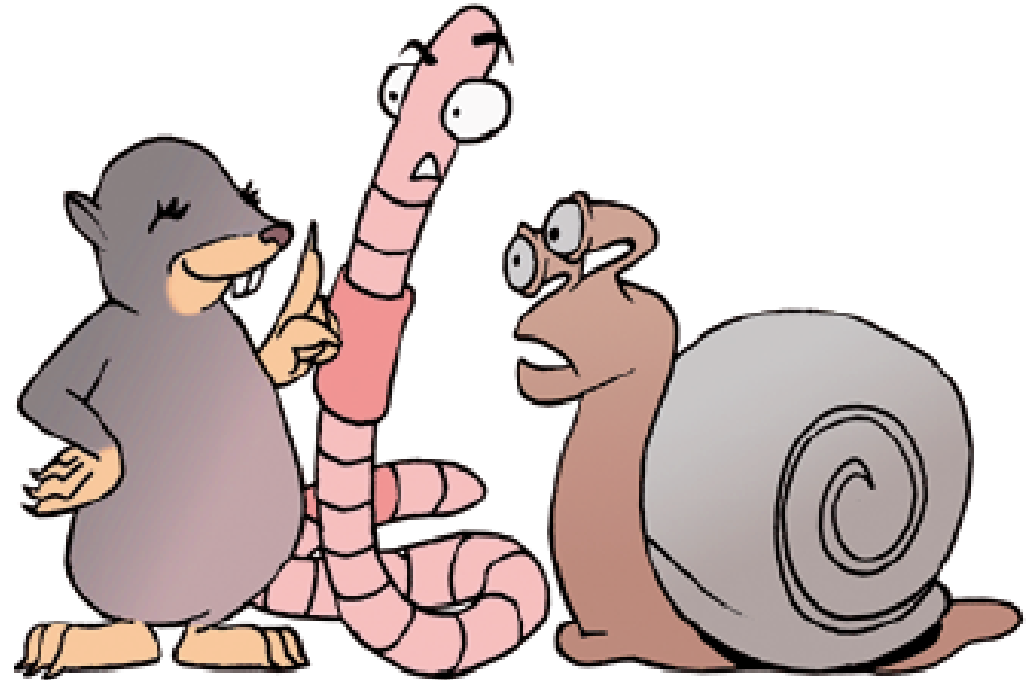
The comic elaboration process (text changes, ISBN, print the copies and send them to the required place) will be coordinated by the DT SECS-GALICIA

Coordinator: Díaz-Raviña M; mdiazr@iiag.csic.es

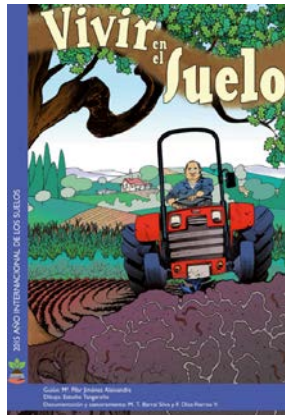
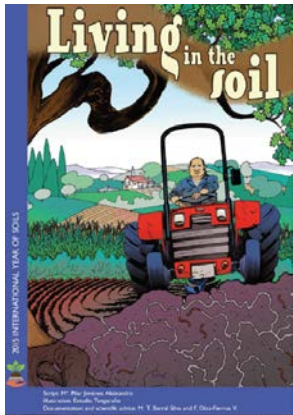
Note: More than 8.000 copies should be printed to get a very affordable unit price

THANK YOU VERY MUCH FOR YOUR KIND ATTENTION !!

Living in the soil



**HELP US ;
SAVE OUR HOME!
LET'S US STAY ALIVE AND HEALTHY!**




COMIC PROJECT: Based on the Galician comic “*Vivir no solo*” (2000), a new version of this one, in different languages (Galician, Catalan, Spanish, English and Italian), was elaborated to commemorate the *2015 International year of soils*


IN ORDER TO DO THIS, IT WAS NECESSARY FOR EXAMPLE:

- a) to include the elements for compliance with occupational risk prevention measures, eg. tractor roll bar, protective masks of agrochemical products and different types of pollutants
- b) updating the data to the villages of the different countries where the history takes place
- c) to translate the comic text into the language of the corresponding edition
- d) to introduce the changes in the comic strip cartoons (text and illustrations) as well as the credits (text and logos) of organizing, collaborating and financing entities of each edition

2000

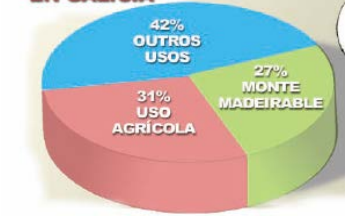


2015




2015

USOS DA TERRA EN GALICIA



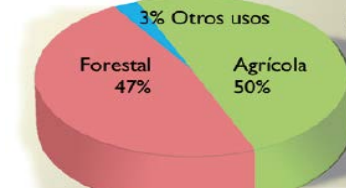
Category	Percentage
OTROS USOS	42%
MONTE MADEIRABLE	27%
USO AGRICOLA	31%

2015




2015

Usos de la tierra en España



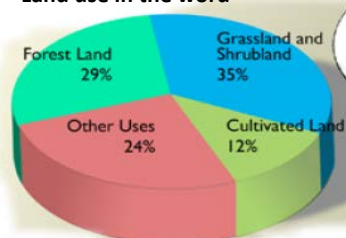
Category	Percentage
Agrícola	50%
Forestal	47%
Otros usos	3%

2015



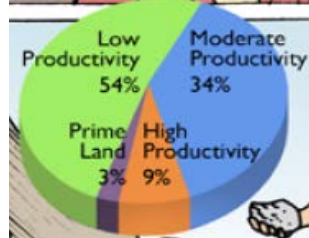
2015

Land use in the word

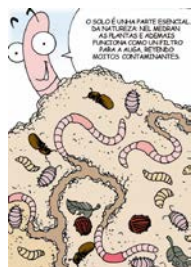


Category	Percentage
Grassland and Shrubland	35%
Forest Land	29%
Other Uses	24%
Cultivated Land	12%

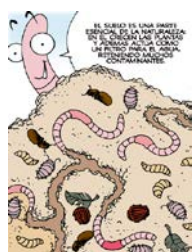
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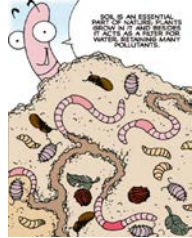
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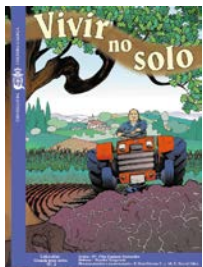


2015



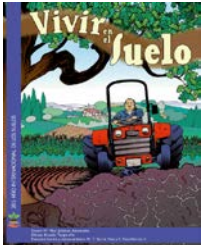
2015

GALICIAN VERSION



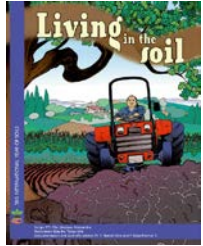
2015

SPANISH VERSION



2015

ENGLISH VERSION



OTHER INITIATIVES: COLLABORATION WITH THE MINISTRY OF EDUCATION



Establishment of a collaboration agreement of the Spanish Society of Soil Science (SECS) with the Ministry of Education that allows the inclusion of innovative and attractive didactic resources and/or field or laboratory activities in the School Library Networks and in the Educational platforms of this Ministry. These resources are updated annually and pilot educational experiences are carried out every year in The Educational Centers of different levels that request them

<http://www.edu.xunta.es/biblioteca/blog/?q=node/766>