LIFE CLIMATREE

Agricultural University of Athens

CLIMATREE IDENTITY

✧**Location:** Greece, Italy, Spain

✧**Budget:** 1.931.447 € of which 1.158.868 € EC Contribution

✧**Duration:** 4 Years, Start: 16/07/15 - End: 28/06/19

✧**Coordinating Beneficiary:** Institute of Urban Environment & Human Resources, Panteion University

✧**Associated Beneficiaries:** Agricultural University of Athens (Greece), Spanish National Research Council (Spain), University of Basilicata (Italy), Terra Nova Ltd (Greece), University of Western Macedonia (Greece)

OBJECTIVES & SCOPE

✧To define a framework accounting and monitoring "CO_2 sequestration of tree-crops" in Europe (emphasis on S. Europe)

✧ To develop a software application of the accounting and monitoring framework

✧To promote the adoption of the methodological framework by EU and National Authorities

✧To delineate mitigation practices in the agricultural sector

EXPECTED IMPACTS

✧A more accurate estimation of carbon sink within EU through the inclusion of the calculated tree-crop capacity

✧Improve the knowledge base for the monitoring and evaluation of effective climate change mitigation actions and measures

✧Make the EU Climate Policies more informative and rigorous

✧Enhancing EU policies on Protected Areas and Ecosystems

✧Promote the integration and mainstreaming of carbon sink objective into Common Agricultural Policy

PREPARATORY ACTIONS

A1 Selection and analysis of tree-crop categories in S. Europe

A2 Adjustment of the "Land use, land-use change and forestry (LULUCF) Methodology" to the environmental problem targeted

A3 Analysis of climatic, environmental and socioeconomic parameters of tree-crop categories in S. Europe

IMPLEMENTATION ACTIONS

C1 Life Cycle Assessment of carbon cycle in tree-crop categories

C2 Projections of future climatic conditions for tree crop categories in S. Europe

C3 Interface development of a software application for accounting tree-crop carbon sequestration

C4 Carbon input / output calculation for current and future years

C5 Suggestions of Climate Change Mitigation policies and measures

MONITORING ACTIONS

D1 Evaluation of the effectiveness of the proposed policies and measures

D2 Assessment of the socioeconomic impact of the project's outputs

D3 Assessment of the impact of the proposed methodology in supporting the ecosystem function restoration

DISSEMINATION ACTIONS

E1 Creation of project's logo

E2 Development, launching and maintenance of project's website

E3 Dissemination of project's progress and results

E4 Development of project's notice boards

E5 Development of Layman's Report

MANAGEMENT ACTIONS

F1 Project management

F2 Monitoring of project progress

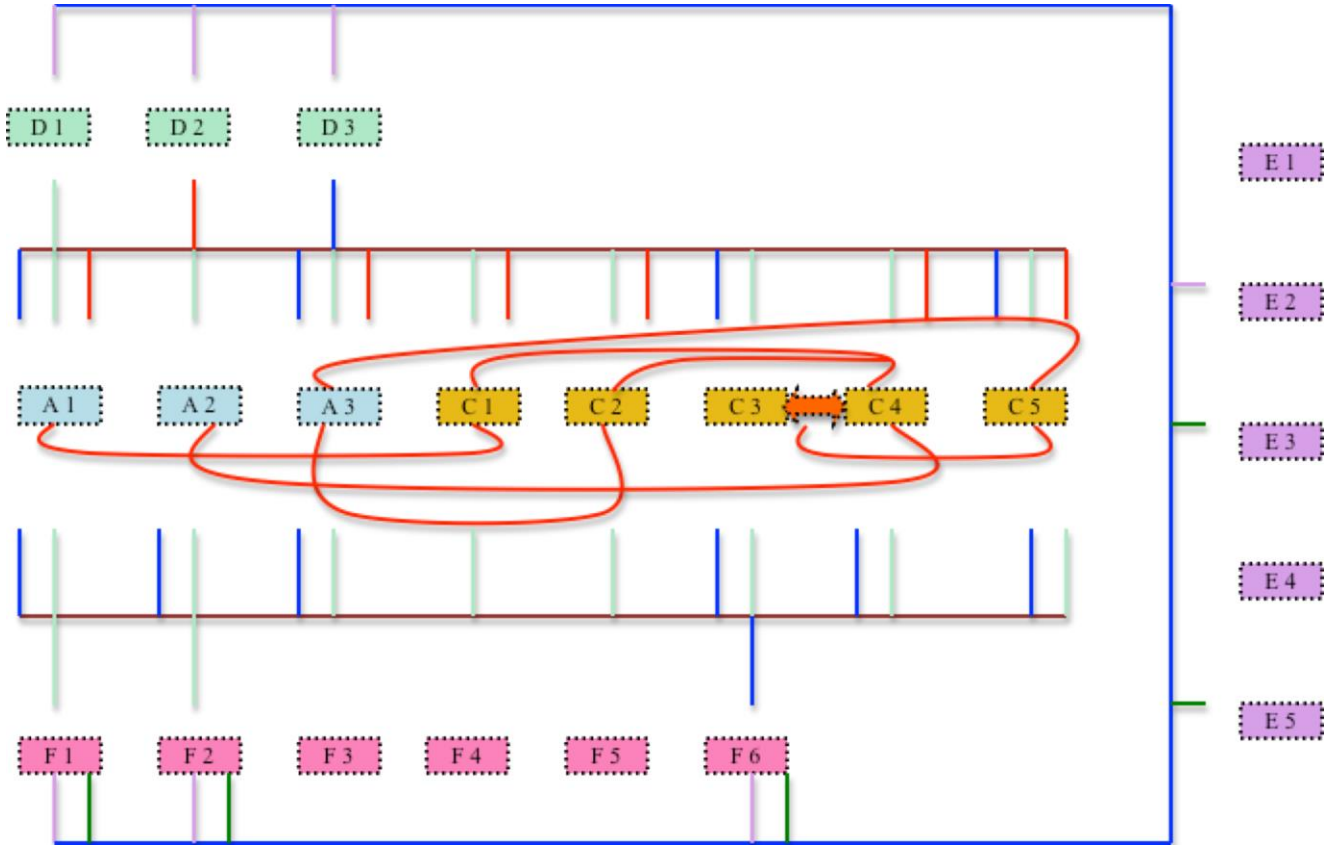
F3 Networking activities with other relevant EU projects

F4 Development of project's After-LIFE Plan

F5 Audit of project's financials

F6 Indicator Tables of Project's Progress

ACTIONS SEMANTIC DIAGRAM



“AGRICULTURAL” ACTIONS

Adjusting LULUCF framework in order to reflect tree cultivations

Identification of those parameters of tree-crops influencing CO_2 sequestration

Identification of effective cultivation Practices

Identifications of appropriate land use policies

Evaluation of the effects of Mitigation Measures

Carbon Input/output of tree cultivation for current and future years

“CLIMATIC” ACTIONS

Identification of the climatic conditions influencing tree-crops in S. Europe

Projections of the relevant future climatic condition

“ECONOMIC” ACTIONS

Evaluating the economic benefits arising from the CO_2 sequestration of tree-crops

Evaluating the holistic economic benefits of tree crops ecosystems

“ENVIRONMENTAL” ACTIONS

Identification of tree-Crops contribution on healthy functioning and restoration of ecosystems

Identification of the main ecosystem services depending on related to tree-crops i.e. water regulation, soil formation etc.

Defining sustainability indicators for the agro-ecosystems at hand

“COMPLEMENTARY” ACTIONS

Dissemination of project’s progress and results (Action E.3)

- **Authorities and organizations accounting of CO_2 sequestration (DG Climate, IPPCC, National Climate Authorities, National CO_2 Inventories etc.)**

- **“Stakeholders” related to mitigations actions. CAP authorities, DEMETRA (Greece), ASSO FRUIT ITALIA Società Cooperativa Agricola of Scanzano Jonico (Italy), CAJACAMPO (Spain), other local agricultural authorities.**

Networking with other Relevant EU Projects (Action F.3)

ACTION A.1: Selection and analysis of tree-crop categories

Two main discrimination characters:

- **Biological**
  - **Evergreen**
  - **Deciduous**

- **Cultivation**
  - **Intensive**
  - **Extensive**

ACTION A.1: Selection and analysis of tree-crop categories

Criteria for the selection of representative Tree-Crops:

- ✧**Total Area of Cultivation, in Hectares**
- ✧**Average Tree-Crop Life-Span, in Years**
- ✧**Annual Crop Yield, in Tones per Hectare**

ACTION A.1: Selection and analysis of tree-crop categories

The present analysis highlighted as representative crops the following:

- **Evergreen Intensive Category: Orange Trees represent almost 87 % of this category's area and correspond to above 90% of the category's annual gross production.**

- **Evergreen Extensive Category: Olive Trees represent almost 97 % of this category's area and correspond to above 90% of the category's annual gross production.**

ACTION A.1: Selection and analysis of tree-crop categories

The present analysis highlighted as representative crops the following:

- **Deciduous Intensive Category: Peach Trees represent almost 41 % of this category's area and correspond to above 37% of the category's annual gross production. An alternative choice for representative crop was Apple Trees that represent almost 20 % of this category's area but correspond to slightly bigger proportion (above 38%) of the category's annual gross production**

- **Deciduous Intensive Category: This Crop category was the most diverse including 6 prominent trees. Among them Almond Trees were preferred for reasons of consistency of their cultivation, biological characters, and fruit characters with those of Chestnut and Walnut.**

ACTION A.1: Selection and analysis of tree-crop categories

Biological categories	Cultivation methodology	Yield (10^3 tn/year)	Dry Matter (10^3 tn/year)	C-H (10^3 tn/year)	C (10^3 tn/year)	CO2 (10^3 tn/year)
Evergreen	**Intensive**	1.043,95	156,59	140,93	105,70	281,87
	Extensive	12.693,23	1.903,98	1.713,59	1.285,19	3.427,17
Sub-Total 1		13.737,18	2.060,58	1.854,52	1.390,89	3.709,04
Deciduous	**Intensive**	2.840,46	426,07	383,46	287,60	766,92
	Extensive	1.387,43	208,11	187,30	140,48	374,61
Sub-Total 2		4.227,88	634,18	570,76	428,07	1.141,53
Total		**17.965,06**	**2.694,76**	**2.425,28**	**1.818,96**	**4.850,57**

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

In this Action's context a Life Cycle Assessment will be performed for all tree-crops, selected as representatives of a tree-crop category, with respect to the parameters influencing the crops carbon consumption and storage.

The parameters will include botanical, agronomical and socioeconomic variables, contributing both directly and indirectly to the crop's carbon sequestration

Subsequently those parameters will be projected onto the rest of the crops included in each group in order to identify the band of value fluctuation, which will allow the development of a reliable predictive model functional throughout the groups.

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

Data acquisition for the study of previous subjects will be performed combining an extensive literature review, field surveys and sampling and laboratory experimentation.

The sampling scheme include's the following 5 tree crops:

1. ***Olea europaea***
2. ***Amygdalus communis***
3. ***Malus sylvestris***
4. ***Citrus sinensis***
5. ***Prunus persica***

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

For all 5 subjects the following samples are collected in order to calculate the total annual biomass production:

I. Annual Biomass Production per tree.
   a. Annual Shots, Leaves (Sample 1)
   b. Fruit (Sample 2)
   c. Root (Sample 3)

II. Biomass stored in herbal tissue
   a. Wood (Sample 4)
   b. Root (Sample 5)

III. Annual Biomass of by-products per tree
   a. Prunnings (Sample 6)
   b. Harvest by-products (Sample 7)

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

In addition to this sampling there will be performed also in the context of C.1, two field surveys through questionnaires. The structuring of the questionnaires is expected to have been completed by the end of October 2016, in order to perform the surveys during the Winter of 2016-17. Those questionnaires relate to:

Cultivation figures cross-reference, aiming to the description and enumeration of:

a. Hours of operation per machinery (including kind of machinery and specifications), per hectare and year
b. Hours of Human Labour, per hectare and year
c. Kg's of Agrochemicals (including kind and application), per hectare and year
d. Kg's of Water (including source and method of application), per hectare per year.

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

Biodiversity figures enumeration, aiming to the enumeration of the following figures, per field (Size of field-in Hectare-to be defined in the questionnaire):

a. Plants: Number of Families and/or Genera
b. Fungi: Number of Families and/or Genera
c. Insects: Number of Families and/or Genera
d. Animals: Number of Families and/or Genera

ACTION C.1: Life Cycle Assessment of C cycle in tree-crops

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THANK YOU

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