### LIFE 09 ENV/GR/000296 adapt2change Newsletter



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### adapt2change Life+ project overview

Agriculture today faces many challenges. WFD and CAP is pushing agriculture to a more sus-

tainable status by minimizing diffuse pollution and reaching good ecological status. Resource management and food security in a changing environment due to climate change is other issue agriculture has to tackle. By introducing an innovative method of cultivation within a controllable environment, all of these issues may be resolved.



Water cycle

Unlike field agriculture, which bases production costs on hectares, greenhouse costs are calculated on per square meter of growing area or on a per plant basis. The production costs represent around

70 - 80 % of the total chain costs in greenhouses, being water and energy consumption the main factors affecting those expenses. Project extents the use of greenhouse horticulture by reducing water and energy demand, by recycling water within a close controllable greenhouse in all water phases, liquid and gas. Because the amount of extra energy required to succeed water recycling is enormous, the use of shallow geothermal energy provides not only the amount of required energy but also a cheap renewable source.

Water in a greenhouse plays a very important role. Water is the currier of nutrients in the hydroponic system and it is used by plants to cool by evapotranspiration. In a greenhouse evapotranspiration by plants is not enough to cool plants so many techniques are used in order to cool the air within a greenhouse. In all of these methods water is sprayed in the greenhouse absorbing heat. From liquid phase water is turned into vapour phase and is rejected because of the higher temperature and thermal energy it curries. As a result growers need to re-compensate this loss by pumping more water to the greenhouse. In this way growers imitate the natural cooling method plants use.

#### **Key points**

- Cooperation between Greek and Cypriot partners
- Pilot Actions in Larisa and Lemesos.
- 2.5M euros project budget
- Multi—discipline project

# Why it is important to protect Water Resources.

For this project four prototype units will be installed in Larissa Thessaly (Greece) and Lemesos (Cyprus) in order to test and demonstrate the innovative aspects of water recycling. Larissa was selected for the harsh climate, the limited water supply and the fact that is the agricultural center of Greece. During winter temperature drops to -10 Co. During summer temperature exceeds 40 Co. It is worth to mention that the European river basins affected by water scarcity in 2030 were identified using the results from the WaterGAP model under the LREM-E scenario in GIS software. Water on an average, is predominantly abstracted for irrigation covering a range of 0% of total abstraction in Eastern RBD (Ireland) to **98 % in Thessaly RBD (Greece)**.

Cyprus government policy also provides for such demand management measures as the restructuring of agricultural cultivations and the promotion of cultivations which require less water, the promotion of water saving measures, the creation of awareness among the public for the proper use of water, the establishment of subsidies for saving good quality domestic water, the metering of water services and use of rising block-tariffs for domestic water supply, the application of a quota system for the allocation of government irrigation water in combination with penalty charges for over consumption, etc.

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### adapt2change partnership

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## **Project Kick off meeting**

A kick-off meeting was organized by TEI of Larisa in Larisa on 27–28<sup>th</sup> September 2010.

During the meeting the project Steering Committee was appointed and the project manager selected. During the kick-off meeting partners have set up working groups in order to finalize project procedures and to complete greenhouse and geothermal installation specifications. It is expected to start the production in the demonstration units by the end of February in 2011.

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# Project objectives

The overall objective of the project is to demonstrate the ability to adapt agricultural production to climate change and limited water supply.

The objectives of the project can be summarized as follows:

- Minimize fresh water use for agricultural production and introduce water recycling method in a close greenhouse system.

- Demonstrate how shallow geothermal energy may be used in water recycling process.
- Introduce renewable energy in agricultural sector.
- Produce a management automation system for greenhouse maximization production.
- Comply with reformed CAP by:
- Improving the competitiveness of European farmers enabling them to cope with the growing water scarcity, fuel prices and external competition.
- Improving the competitiveness of rural areas.
- Maintaining the environment and preserve Europe's rural heritage.
- Evaluation of projects findings on water recycling in agriculture on national agricultural policy. (Greece -Cyprus)
- Minimize land requirements for agriculture.
- Minimize environmental effects of agriculture.

- To decrease the emissions of greenhouse gases and to assist the farmers to comply with current and upcoming environmental regulations.

- Adapt agricultural production practices to the constraints and opportunities of a changing climate.

- Farm-level adaptation Sectoral-level adaptation
- Demonstrate a production system suitable for a wide range of environmental conditions
  - Provide to producers a Remote Support System.



Shallow geothermal power