



LAYMAN'S REPORT

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AUGUST 2019



PROGRAMME DETAILS

**TITLE:**

Revamping organic farming and its products in the context of climate change mitigation strategies

ACRONYM:

ORGANIKO LIFE+ (LIFE14 CCM/CY/000990)

DURATION:

4 years (2015–2019)

BUDGET:

€975.951

FUNDING:

58% Co-funded by the European Union's LIFE programme

PARTNERS:

Cyprus University of Technology (coordinator)
Agricultural Research Institute (Cyprus)
Department of Environment (Cyprus)
Kyoto Club (Italy)

WEBSITE:

www.organikolife.com

CURRENT SITUATION

More than any other European geographical cluster, the agricultural sector in Southern Europe has been adversely affected by a number of serious climate change impacts (reduced annual rainfall, increased temperatures, unexpected floods and prolonged heat waves) resulting in a reduction of the crop productivity, degradation of soil and biodiversity as well as in an increased risk of food safety and biodiversity of natural resources.

The ORGANIKO LIFE+ project places particular emphasis on actions that mitigate the impacts of climate change on agriculture, the environment and humans. The environment, and in particular agriculture, contributes only partly to the greenhouse gas emissions (10%, Eurostat, 2019), but the global warming potential from nitrous oxide and methane (greenhouse gases) is 265 and 28 times greater than that of an equivalent mass of carbon dioxide, respectively (IPCC, 2019).

Organic farming in Cyprus in recent years has been showing an increasing trend in arable land, however the total organic area under cultivation is below the average of the 28 Member States of the Union, standing at 4.6% of the total cultivated area (Eurostat, 2017).

It is widely acceptable that organic farming promotes environmental sustainability but there is no clear evidence of climate change improvement (e.g. greenhouse gas emissions). Also, there is no clear scientific evidence that eating organic foods is associated with better health. Several studies have been published on the nutritional value of organic foods, but there is a need to translate nutritional value into potential positive effects on human health using interventional randomised clinical trials which, to date, are scarce.

In addition, for two decades now, obesity rates in Cyprus have been very high (among the highest in Europe) in both adults (25.5%, WHO, 2013) and children (21% boys & 19% girls between the age of 6 and 9, COSI, 2018), showing no improvement.

COSI, Childhood Obesity Surveillance Initiative (COSI) Factsheet. Highlights 2015-17. 2018. <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2018/childhood-obesity-surveillance-initiative-cosi-factsheet-highlights-2015-17-2018>

Eurostat Website <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

IPCC. 2019. Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems Available at: https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf (accessed August 15, 2019)

WHO Global Health Observatory Data Repository [online database]. Geneva, World Health Organization, 2013 (<http://apps.who.int/gho/data/view.main>, accessed 21 May 2013). http://www.euro.who.int/__data/assets/pdf_file/0004/243292/Cyprus-WHO-Country-Profile.pdf?ua=1

AIMS OF THE PROJECT

The project's main aim was showcasing the comparative advantages of organic farming and its products over conventional farming.

The following indicators were used to showcase these advantages:

- Effectiveness of climate change mitigation
- Agronomic and environmental quality
- Pesticide exposure and oxidative stress/inflammation biomarkers in relation to the systematic consumption of organic foods by children

The specific aims of the project were:

- 01 To develop a **strategic national plan** that will update governmental actions in promoting organic farming and its products, thereby contributing to mitigating climate change in Cyprus.
- 02 To showcase the **comparative environmental performance of organic agriculture** using a range of climate change mitigation indicators in conventional and organic crops.
- 03 To evaluate the potential **benefits of a systematic organic diet on health indicators in primary school children**.
- 04 To **adjust protocols for organic farming** (apples and barley) that are of particular importance to the characteristics of the local soils and microclimates of the Cypriot agriculture.
- 05 To **disseminate the results of the project to the greatest extent possible** with the scientific community, the stakeholders and the general public both in Cyprus and in Italy.

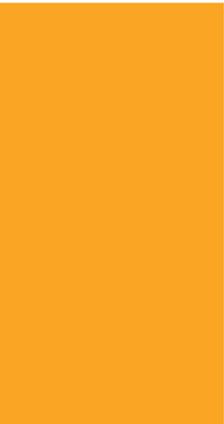


- 06 To **assess the preferences and perceptions of Cypriot consumers** during the project.
- 07 To **promote healthy eating at school** in order to improve the health profile of children.



ACTIONS

- 01 A study was conducted using questionnaires and field visits to organic farmers while educational meetings with farmers interested in organic farming were held in various villages of Cyprus.
- 02 Two consumer surveys were conducted with a representative sample of the Cypriot population in all the cities of Cyprus both at the beginning and at the end of the project, aiming at assessing the public's attitude towards organic foods. The first survey took place in 2016 with a sample size of 420 adults and the second one in 2019 with a sample size of 455 adults.
- 03 During the last three growing seasons, field greenhouse gas emission measurements were carried out on the organic crops used for the purposes of the project.
- 04 A randomised clinical trial entitled "Organic diet and children's health" was conducted in primary school children in Cyprus.
- 05 The following project dissemination activities were carried out:
 - 5 informative workshops for the public
 - 7 awareness programmes for children
 - 6 awareness programmes for parents
 - 2 live radio broadcasting events
 - 1 open day event
 - 4 educational workshops for farmers
 - >10 participations in relevant events
 - 2 short-chain organic markets at the Cyprus University of Technology (CUT)
 - 1 expert visit from Harvard University
 - 7 newsletters
 - 3 newspaper articles
 - 2 brochures
 - >5 interviews on the radio and television
 - 3 videos
 - Visits to farmers
 - Organisation of an international conference on climate change in Limassol
 - Development of an advisory action plan for the government
 - Layman's report
 - Instructions for farmers
 - Participations in 10 conferences with oral presentations or posters
 - Publication of 4 scientific articles in prestigious international scientific journals
 - Press releases on project events and activities on online blogs, newspapers, television and radio
 - In Italy: Organisation of 6 awareness programmes, 4 educational workshops for the local authorities and farmers, 4 technological and legislative workshops, 4 project team visits to relevant stakeholders, 3 public dissemination events



RESULTS



Briefing of FAO officials on project results

01

National Advisory Plan

In order to assist in updating and applying effective policies for the development of organic farming in the Republic of Cyprus, the ORGANIKO LIFE+ project prepared an action plan proposing sustainable actions and measures that significantly improve the existing “National action plan for the development of organic farming” of the Republic of Cyprus. The action plan relied on the various studies, findings and results of the work carried out by all partners in the ORGANIKO LIFE+ project. In the action plan, the current conditions in the production and market of organic products in the Republic of Cyprus were analysed and the wider use of organic products in green public procurements was suggested. It shall be noted that the proposed action plan has taken into account the views of all the relevant stakeholders and is considered as the crowning point of all the efforts and actions of the project team. The action plan was submitted to the competent Ministry of Agriculture and, in particular, to the Cyprus National Council of Organic Farming.

02

Increasing trend in the purchase of organic food products

The first consumer survey conducted in 2016 showed that consumers are interested in organic products, but they are sceptical about their quality and genuineness. Nevertheless, it seems that there is a slow, yet dynamic development, probably due to European and national policies on the promotion of organic farming as well as the significant role of the ORGANIKO LIFE+ project in organising numerous events and campaigns.

More specifically, the first consumer survey showed that:

- a. The model used was appropriate to capture consumer attitudes and behavioural intentions towards organic foods.
- b. There are significant differences between men and women, such as the subjective rules of women that affect their behavioural intentions in purchasing organic foods, which is not the case for men.
- c. There are significant differences between people who bought organic foods in the past

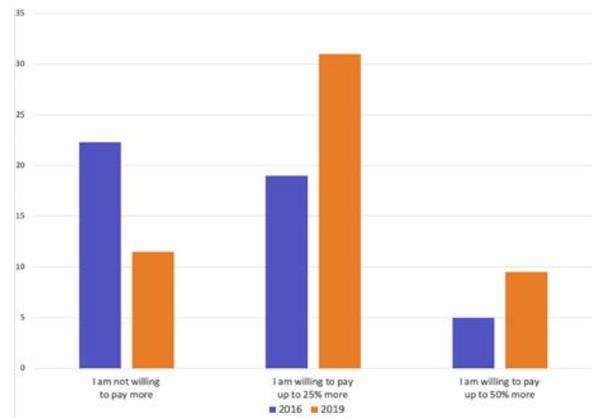
and people who have not bought organic foods, a finding which reinforces the effect of behavioural control on behaviour.

In comparison to the first survey in 2016, the second consumer survey conducted in 2019 showed that:

- a. 75% of consumers have bought organic foods, showing an increase of 15% compared to 2016. In addition, there was an increase in the purchase frequency.
- b. There was an increase in the percentage of households purchasing organic foods in comparison to conventional foods in 2019; the increase concerns all food categories.

07

c. Consumers, who participated in the 2019 survey, showed intention to pay more for organic foods in comparison to 2016. More specifically, only 11.5% of the participants (2016: 22.3%) do not intend to pay extra money for organic foods, whereas 31% (2016: 19%) intend to pay up to 25% more and 9.5% (2016: 5%) intend to pay up to 50% more.



Intention to buy organic food (results of both consumer surveys (2016 & 2019))

03 Improvement of organic farming practices

As a contribution to climate change adaptation, improved protocols for organic farming practices for apple and barley crops were developed and adapted to the climate and soil of Cyprus (you can find them on the project's website: www.organikolife.com).

04 Climate change mitigation – Calculations of greenhouse gas emissions

Field measurements on crops for 3 consecutive years recorded much lower emission factors of direct nitrous oxide (N₂O) from soil. Further results showed that the application of biological fertilisers and flexible crop rotation led to a significant reduction of N₂O emissions. In particular, N₂O emission factors were calculated to be 0.3 – 0.35 for barley following application of animal manure and much lower (0.11 – 0.19) following application of compost. In addition to the plant nutrition strategy, N₂O emissions are also linked to climatic conditions and the levels of available N in soil.

The findings of the Agricultural Research Institute during the project, indicate that the magnitude of greenhouse gas emissions from agricultural ecosystems in Cyprus has been overestimated, and consequently the estimated cost for the Republic of Cyprus.

05 Techniques for reducing greenhouse gas emissions

The findings of the project show that the application of composted materials and the appropriate crop rotation design result in a significant reduction of greenhouse gas emissions in organic farming systems without reducing productivity. Furthermore, it appears that the application of compost extracts significantly contributes to the reduction of direct N₂O emissions in apples, without leading to a significant reduction in the efficiency of the production system.

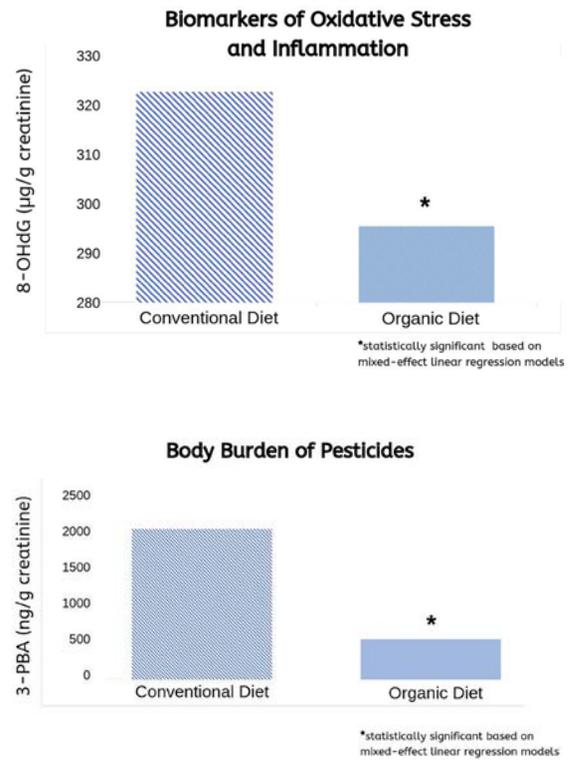


Application of compost to organic crops

06

Organic diet and health

The results of the randomised clinical trial in Cyprus on “Organic diet and children’s health” were published in the international scientific journal, PLOS ONE. The ORGANIKO trial results study showed: i) the clear benefit of an organic dietary treatment in significantly reducing the body burden of pesticides (pyrethroids and neonicotinoids), and ii) significantly lower levels of oxidative stress/inflammatory biomarkers as the likely result of the pesticides’ body burden reduction in healthy children aged 10-12 in Cyprus. Such oxidative stress/inflammatory biomarkers are considered as early-stage indicators for chronic conditions, such as obesity, type 2 diabetes or cancer. Around 150 children followed their regular diet for 40 days (conventional diet in which fruits, vegetables and other foods may usually contain pesticide residues) and an organic diet for another 40 days which was provided by an accredited organic restaurant. Children’s compliance to the organic diet was assessed as high (≥ 90%).



Concentrations of pesticide metabolites and oxidative stress/inflammatory biomarkers during the conventional and organic periods of the “Organic diet and children’s health” study.

07

Dissemination of results

The project team placed particular emphasis on raising public awareness and educating farmers about organic farming, through the actions and deliverables of the project.

29.000



people participated in the project’s activities

18.000



people were reached through websites and social media

2.012



students, parents and headmasters from schools in Cyprus participated/were informed about the project

74



companies selling organic products were involved in the project

37



non-profit organizations and other stakeholders were involved in the project

BENEFITS AND SOCIO-ECONOMIC IMPACTS





Implementation of an action plan to strengthen the organic market

The implementation of the action plan for organic farming and products at a pan-Cyprian level is expected to revitalise the organic market, from farm to consumer, with targeted actions that are expected to bring benefits to the climate, biodiversity and human health.



Integration of organic products into school canteen menus

The project team contributed to the discussions on integrating organic products in the recently revised Green Public Procurement Plan for Cyprus, in particular with regard to schools, by integrating a new rule requiring from the authorities of primary schools to include specific organic products in the school canteens menu. The team of the ORGANIKO LIFE+ project helped the Cyprus Organic Farmers Association to prepare a list of local organic products that will be available throughout the year in large quantities.



03

Continuous promotion of organic farming

The ORGANIKO LIFE+ project has mobilised the competent authorities to expand the scope of continued investment in organic farming and products. The activities after the completion of the project aim at promoting organic farming and products through important channels, such as the Ministry of Agriculture, Rural Development and Environment, the Ministry of Education and Culture, the Commissioner for the Environment, public universities in Cyprus and the Cyprus Organic Farmers Association. A team of doctors/researchers from the Medical School of the University of Parma (professor De Angelis's team) have expressed their interest in replicating the study conducted in primary schools using the same tools. In a pilot fashion, they were able to collect samples of 5 children in Parma who followed a similar diet plan to that followed in Cyprus.



Discussion of project results at the Italian Ministry of Agriculture

04

Reduction in the national costs of greenhouse gas emissions

Field measurements of N₂O emissions from soil in barley production systems, calculated by the Agricultural Research Institute during the ORGANIKO LIFE+ project, are expected to reduce the national cost of emissions by €2.270.000 (unpublished calculations from the Department of Environment of the Ministry of Agriculture) per year. The Agricultural Research Institute has prepared an official report for the Ministry of Agriculture to facilitate the adoption of the lower emission factors by the greenhouse gas emissions Inventory Office. The results of the project will be able to be transferred to areas of the EU and the wider region of the Southeast Mediterranean that have similar climatic conditions to those of Cyprus. Table 1 summarises the emission factors for 2 consecutive years for three crops.

Table 1. Emission factors for 2016-2017 and 2017-2018

	Barley	Vetch	Pea
2016-2017			
Compost	0,11	0,15	0,15
NH₄NO₃	0,25	0,17	0,16
Manure	0,23	0,24	0,25
2017-2018			
Compost	0,19	0,15	0,03
NH₄NO₃	0,24	0,34	0,11
Manure	0,21	0,23	0,18



Short-chain organic markets at the university

The project and its actions have been adopted by innovative initiatives at the Cyprus University of Technology (CUT), such as the CUT Green Office and the Work-Life Balance Committee. The Green Office, after contacting the Cyprus Organic Farmers Association, attempted to integrate organic products into the university cafeteria and participated as a co-organiser in the two short-chain organic markets organised by the project team at CUT. The Work-Life Balance Committee, responsible for the administrative staff of CUT, organised an introductory lecture on organic products as they consider organic food being part of a healthy lifestyle.



Snapshot from the short-chain organic market organised at the university



Discussion of project results at the European Parliament and the House of Representatives of Cyprus

Project findings were discussed in the House of Representatives of Cyprus in early April 2018 through questions from Members regarding the project's impact. These conclusions, as well as the findings of the ORGANIKO LIFE+, were presented at a European Parliament conference in Brussels in May 2018 in the presence of five prominent MEPs who were briefed on the so far results of the project on the role of organic diet in improving health indicators and the role of organic farming in mitigating climate change.



Discussion of project results at the European Parliament

It is worth noting that the MEP, Mr Mavrides, who attended the presentation in the European Parliament, asked the European Commission a question regarding the consequences of climate change in Cyprus (<http://bit.ly/2BLd20A>). More specifically, he referred to the low share of the organic market in Cyprus and to the fact that Cyprus is already facing the effects of climate change. The European Commissioner for Climate Action and Energy, Mr Cañete, responded by saying that the Commission is fully aware of the challenges Cyprus is facing due to climate change, while stressing that the estimated losses due to extreme weather and climate conditions in Cyprus, between 1980 and 2016, were approximately 390 million euros (<http://bit.ly/2wqJpf7>).



The organic lifestyle starts at school

The project team submitted a proposal on the EU Call for Organic Innovations 2017 entitled "Organic lifestyle starts at primary school". This proposal was among the runners-up and the jury found it promising. The EU TP Organics platform presented it at the Innovation Arena on its website (<http://tporganics.eu/organic-lifestyle-starts-at-primary-school/>).



Tackling childhood obesity

On 20 February 2019, the Council of Ministers announced that the programmes on tackling childhood obesity have been approved. The ORGANIKO LIFE+ project team welcomes this decision on healthy eating at schools, which is very much in line with the results and recommendations of the project team. The proposed measures are in the right direction and will require continuous monitoring and evaluation to implement more effectively the intervention measures for the children in Cyprus.



Declaration for healthy eating at schools

The Declaration for the healthy eating at schools was made by the participants during the event organised by the project team on 14 December 2018 at CUT. The participants, who were members of universities, government agencies, associations and federations, support the promotion of targeted actions to effectively promote the health and well-being of children in primary and secondary education. Some of the suggestions include: (a) revision of canteen contracts and upgrade of the operation of the Canteen Supervisory Committees in each school, (b) compulsory education of all parents on matters regarding child nutrition and exercise through the Parents Association, (c) conversion of all the primary schools into all-day schools with a defined diet that promotes healthy eating, (d) establishment of a State Food Agency with a holistic approach to nutrition and health.



National Council for Organic Farming

A member of the ORGANIKO LIFE+ team (Dr. Michalis Omirou) has been appointed as a member of the National Council for Organic Farming and through the Council, the promotion of the project findings to farmers and the public was decided through training activities for organic farmers in Cyprus.



Green Public Procurements

The Public Procurement Directorate of Cyprus has made a significant step in implementing the Green Public Procurement policy, following the agreement they signed with suppliers/producers of organic food. A recent letter (26 March 2018) addressed to the general directors of the three Ministries (Education and Culture, Health and Defence) presented the list of registered organic products and recommended that the above-mentioned ministries purchase organic food either on the basis of the list or through tenders. The ORGANIKO LIFE+ project welcomes the agreement as it has made several efforts towards this direction, such as meetings with stakeholders, seminars and short-chain systems for the marketing of organic products at the university.



The two-day international conference CLIMATICO 2019, held on 11 – 12 April and organised by the project team, focused on the impact of climate change on agriculture, food and public health in the Mediterranean region. Attendees represented several countries, including Serbia, Germany, Greece, the Netherlands, Lebanon, Italy and Cyprus. The Minister of Agriculture, Rural Development and Environment, Dr. Kadis, highlighted in his speech that Cyprus is already affected by climate change, mainly due to phenomena such as high temperatures, prolonged droughts and extreme weather conditions. This is expected to have a significant negative impact on agriculture and food production, as well as on the water and soil resources, he added, while welcoming the Ministry's support in efforts to promote innovation for a better environment while ensuring a sustainable agricultural development. He also congratulated the organisers of the conference, stating that it is the epitome of the efforts of the research groups and government departments involved in the ORGANIKO LIFE+ project.



PROJECT SUSTAINABILITY

Although the ORGANIKO LIFE+ project has been completed, its actions are ongoing. Some of the key activities that will be carried out for the sustainability of the project include:

- ♦ A series of courses for farmers on the best organic farming techniques.
- ♦ Seminars and workshops for the public on the health and environmental benefits of organic farming.
- ♦ Dissemination of the results of the consumer surveys conducted in Cyprus to the Ministry of Agriculture, Rural Development and Environment, and creation of material for various stakeholders (government, municipalities, traders, farmers).



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