

# ISLAND OF IKARIA



Towards a pilot ecological island

Municipality of Icaria  
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## GEOGRAPHY-POPULATION-HISTORY

**Ikaria**, is a Greek island in the Aegean Sea, 35 miles off the coast of Turkey, southwest of Samos. It derived its name from Ikarus, the son of Daedalus in Greek mythology, who fell into the sea nearby. Ikaria has been inhabited since at least 7000 BC, when it was populated by the Neolithic pre-Hellenic people that Greeks called Pelasgians. It is said to be the birthplace of Dionysus, the Greek god of wine. In 1827, during the Greek War of Independence, Ikaria broke away from the Ottoman Empire, but was not included in the narrow territory of the original independent Greece. In July 17, 1912 the Ikarians expelled a Turkish garrison and thereby achieved independence. On July 18, 1912, the Free State of Ikaria was declared and after five months it became part of Greece.

It is one of the middle islands of the northern Aegean, 255km<sup>2</sup> (99mi<sup>2</sup>) in area with 102 miles (160 km) of coastline and a population of almost 9.000 inhabitants. It is accessible by airplane and boat. The topography is a contrast between verdant slopes and barren steep rocks. The island is mountainous for the most part and at some points quite inaccessible, with lovely, green valleys, wild falcons and some amazing beaches. It is traversed by the Aetheras mountain range, whose highest summit is 1,037m. Most of its villages are nestled in the plains near the coast but also on the mountains. Ikaria has a tradition in the production of strong red wine. Many parts of the island, especially the ravines, are covered in large bushes, making the landscape lush with green. Aside from domestic and domesticated species, there are a number of small wild animals to be found, such as martens, otters, jumping spiders and toads. Ikaria exhibits a typical Mediterranean climate with sunshine for 2915 hours per year but especially in July this might reach the 398 hours in a month (one of the greatest in Greece). The island is famous for its 8 mineral thermal hot springs, which reportedly have numerous therapeutic benefits. The island was used as a place of exile since the ancient years and also for the communists after the end of the Second World War and was for many years isolated. The isolation and poverty have forced many of Ikaria's inhabitants to immigrate, mainly to the United States.



Ikaria was the subject to repeated invasions by the Persians, Romans, Turks and pirates, causing the population to move away from the sea to the central area of the island and to construct its homes from natural materials. This created an isolated population, rich in tradition, family values, health and long life. A special self-sufficient model of living was established, based on cover, concealment, austerity, subsistence and a strong sense of community. The island has 52 scattered populated settlements without civil center unlike all the other Aegean islands. The people on the island live off fishing and farming, and many of them work on boats or are involved in tourism. The Ikarian wine has been produced and praised since antiquity.

It is also known for the unusually long life spans of its natives, a fact that has caught the attention of researchers and is featured in the second edition of National Geographic explorer Dan Buettner's book "**The Blue Zones**" which describes communities with high longevity rates worldwide. Chronic diseases are a rarity in Ikaria. People living in this region have 20% less cancer, half the rate of cardiovascular disease, and almost no dementia. People traditionally have farming or fishing jobs and live in a mountainous terrain, which keeps them active throughout their life.



# THE “ECOLOGICAL TOWNS IN THE MEDITERANNEAN SEA”

## PROJECT PHASES AND ACTIONS

### Phase 1: Water & Waste

#### 1.1. Water Management

##### Current situation

Ikaria has an abundant supply of water. Over the mountains the rivers have dug a series of large ravines, and although in summer have little or almost no drinking water, in the winter there is flooding, and in some cases forming very raging torrents. Ikaria has water and rainfall, up to 76.2 mm annual rain. Most rain falls between the months of October and March. But as the cold is mitigated by the effect of the Ikarian Sea, winter looks rather like autumn in North America or Europe with some little colder periods.

**Drinking Water:** Originates from several different sources and hence there can be a risk of pollution caused by nearby anthropogenic activities and also from the natural erosion of the rocks. During summer period the water supply becomes insufficient due to over consumption in many areas on the island.

**Waste Water:** Is discharged into the soil through septic tanks apart from the two most visited areas of Evdilos and Armenistis, where sewage treatment plants operate. Unfortunately, in the capital of the island named Ag. Kyrikos waste water is being directed mostly into the sea. In the areas of Faros, Karavostamo, Ag.Kyrikos, Gialiskari and Karkinagri sewage treatment plants are designed but still very far from the phase of construction.

##### **Thermal Water:**

Ikaria's abundant therapeutic radio energized spring sources have been identified as amongst the best in the world in terms of healing qualities, radioenergy and water supply. The essential elements in Ikaria's therapeutic radioenergetic hot mineral springs are saline radium and radonium. The radio energized mineral element saline radium and its gaseous form, radonium, has been geologically diluted in the springs by nature. Ikaria's springs are singular and unique in the world for their varying degrees of temperature and radio energy which can accommodate many different forms/strengths of therapy.



## Projects to implement

- To measure water quantity and quality
- To continuously test the drinking water to improve its quality.
- To construct or upgrade the existing water reservoirs and dams in order to exploit the winter flooding
- To set up sewage system for the most populated areas (Ag. Kyrikos, Gialiskari, Faros, Karkinagri, Karavostamo)
- To construct sewage treatment plants (even small compact plants)
- To upgrade the sewage treatment plant of Evdilos and Armenistis
- To upgrade and renovate the thermal springs facilities

## 1.2. Waste Management

### Current situation

There were five uncontrolled waste disposal fields, in which organic and non-organic waste was buried for years in a way that did not meet security and soil protection norms. Nowadays uncontrolled waste disposal fields exist only in Evdilos and Raches. A new landfill is being designed following the modern-in Greece-environmental standards and it is expected to operate in 20 months receiving only non-recyclable and non-organic waste. This landfill is expected to accommodate the whole island for the next 30 years along with 2 transfer stations. All over the island recycling bins are dispersed for aluminum, glass and paper. The collected items are being directed to recycling plants in Athens.

### Projects to implement

- To distribute individual bio-composters, which transform organic waste into fertilizer
- To set up a policy of sorting the village's household waste with specific bins placed in every village and its entrances.
- To install special containers for collection of fat and frying oil and disposal for production of biofuels and bio-lubricants
- To expand the recycling network to more places
- To construct new landfill
- To eliminate and restore uncontrolled waste disposal fields

## Phase 2: Renewable energy

### 2.1. Renewable energy sources

#### Current situation

Ikaria has sunshine for 2915 hours per year and especially in July when this might reach 398 hours in a month. It is very windy with an extremely large estimated wind potential. High-enthalpy geothermal fields have also been located in Ikaria.

The power of the electric network of the island is mainly produced by the autonomous thermal station with total power 14396 KW, which is in Agios Kyrikos. Alternatively there is a small wind farm electricity power 385 KW, which is off and one wind power 600 KW, belonging to a private company. The total CO2 emissions of the thermal station with the method of fixed rates were approximately 5730 tons.

The Public Power Corporation (PPC) runs a hybrid energy project in Ikaria, which is a combination of hydro and wind energy. The estimated power output is 2,4 MW of wind power and 3,8 MW from hydro. The involvement of both RES (wind-hydro) in annual production could reach 82.5% of total power output. Given the Greek economic crisis this project is under risk due to lack of funding.

A private energy firm is planning the installation of numerous wind turbines over 28 square kilometers. The huge construction costs and the emerging local reaction are likely to block the project.

#### Projects to implement

- To utilize the geothermal fields for heating the area of Agios Kyrikos
- To create small wind farms for electricity supply
- To reduce the CO2 emissions of the thermal station
- To equip the public buildings and schools with solar panels for electricity and heating
- To promote the use of solar panels in roofs for electricity

## Phase 3: Agriculture & Forests

### 3.1. Agriculture

#### Current situation

The main cultivated area is covered with olive trees, vineyards, apricot trees, almond trees and various horticultural products. Agriculture is not exercised as a commercial activity but mostly for personal needs.

#### Projects to implement


- To promote the standardization of the local products such as wine, honey, milk and cheese
- To assess the cultivated area and the used pesticides
- To reduce the water consumption

### 3.2. Reforestation

#### Current situation

Overgrazing by domestic animals like sheep, goats and cows has been responsible for large scale degradation of the vegetative cover in many parts of Ikaria. What constitutes overgrazing is failure to move or rotate animals in harmony with forage growth. The current situation of uncontrolled overgrazing and desertification of land is a serious and immediate socio-economic and environmental threat to the island. In 42% of the territory of the island there is a direct and potent risk of desertification.

Ranti Forest is the most significant eco system in Ikaria. It is a mature *Quercus ilex* forest and spans 16.7 km<sup>2</sup> of central Ikaria and covers approximately 8% of the island. It comprises an array of important habitat types over altitudes ranging from 200 m to 900 m. These habitats include: *Q. ilex* evergreen forest, heartland, scree slopes, phrygana and *Platanus orientalis* L. stands (oriental plane). It is this combination of habitats and altitude that has created an invaluable ecological niche for many species of flora and fauna. Biodiversity flourishes due to the range in age and composition of the stands throughout the forest. Within the core of the forest, trees have been aged at over 300 years old, whereas in other sections of the forest there are a high percentage of saplings. Around the northern perimeter of the forest, where there are small settlements, agriculture has had an ongoing negative impact on the forest and its regeneration process. This is due to the continual encroachment of the farms onto the fertile forest land. This land is used for agriculture and grazing along with the removal of trees for charcoal and fire



wood. However, in recent centuries, it has predominantly been overgrazing that has had the most destructive impact on the forest. When Greece joined the European Union (EU) in 1981, farmers became eligible for grant schemes under the Common Agricultural Policy (CAP) and thus an excess of goats were reared as a result (Abergel *et al.*, 2008). Today, there are many shepherds, whose goats are grazing illegally within the Ranti forest. This has happened as a consequence of both EU legislation and lack of efficient management and enforcement of local laws. It is thought to have a major negative impact on the forest and its natural regeneration.

An Aegean Seed Bank is operating on Ikaria which aims to collect and to preserve for the long term, as well as to promote and encourage cultivation of local varieties of agricultural plants, mainly from the Aegean islands. Seeds from endemic, protected and other species of island flora are being collected and preserved

### Projects to implement

- To develop standards of controlled grazing and dispersal of animals over larger areas
- To promote proper grazing management by moving animals before they have the opportunity to re-graze lush re-growth
- To limit animals' grazing time, and fence in animals
- To construct a small slaughterhouse to reduce animals found on the island
- To set up an electronic monitoring system to prevent forest fires
- To identify the diversity, density, size and health of the trees of Ranti forest
- To establish the habitat boundaries of the Ranti forest planting programme
- To organize a planting follow up
- To expand the Seed Bank and present it to the wider public for educational purposes
- To collect information and participation in related conservation activities for the development of environmental awareness in the local communities and the wider public.

## 3.3. Coast remediation

### Current situation

There are 102 miles (160 km) of coastline, which welcome thousands of visitors every year especially during summer months.

### Projects to implement

- To assess the ecological status and life of the coastline
- To provide supervising mechanisms for their maintenance
- To create the volunteer culture among people and friends of Ikaria for coast-cleaning
- To assess the quality of water
- To create a diving park both for research and tourist reasons





## Phase 4: Education and interactivity

### Current situation

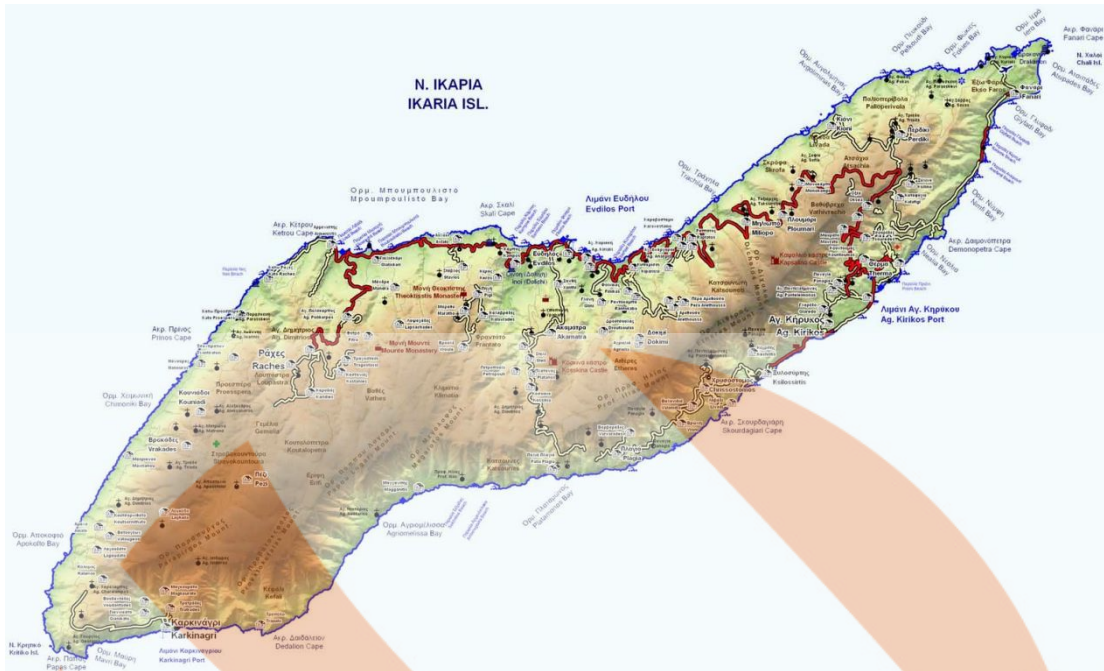
16 primary and 6 secondary schools with limited environmental awareness programmes

### Projects to implement

- To provide educational tools in coordination with teachers
- To hold conferences and field activities for students & teachers
- To implement students exchange programs with other ecological villages

**Map N° 1:** Ikaria geo-physical map

**Map N° 2:** Ikaria satellite map



**Map N° 1:** Icaria geo-physical map



**Map N° 2:** Icaria satellite map