



**CENTRE FOR RENEWABLE ENERGY SOURCES
(CRES)**

GEOTHERMAL DEVELOPMENT AND SOCIETY
The case studies of Milos and Nisyros Islands

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BACKGROUND (HISTORY)

- Milos and Nisyros are islands rich in geothermal potential.
- Several geothermal fields of high and low enthalpy are allocated in these islands.
- In Milos, the first attempt for the exploitation of the island's geothermal potential became during 1980's, aiming at the manufacturing and operation of a pilot unit of 2 MW power production.
- Series of episodes and accidents with environmental impacts as well as erroneous energies, led the local society to shape completely negative position and imposed the pause of the station's operation .
- In Nisyros island, the geothermal researches began in 1973 as part of a geothermal project of the Institute of Geological and Mineral Exploration and for the power production. In 1982 and in 1983 the geothermal potential of the island was explored from the Public Power Corporation (They drilled two wells from an Hungarian company "NIREX" in 1983 with financing of EC).
- The experience from the test drillings in the island of Nisyros, as well as the relative problems in Milos, led the residents of Nisyros, to express their opposition in every thought of exploitation of this potential, with referendum that was held in 1997.
- These facts, influenced in total the sector of geothermics in Greece in combination with the entire lack of relative legislative framework.

THE SOCIAL SURVEY IN MILOS AND NISYROS ISLANDS

Evaluation of data that structures the relation of geothermal development and society

Recording and analysis of opinions of residents of two islands with regard to the subjects of geothermal development.

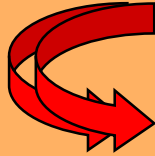


Evaluation of predominant problems that cause the reactions and appointment of main axis of interventionist energies that should be followed.

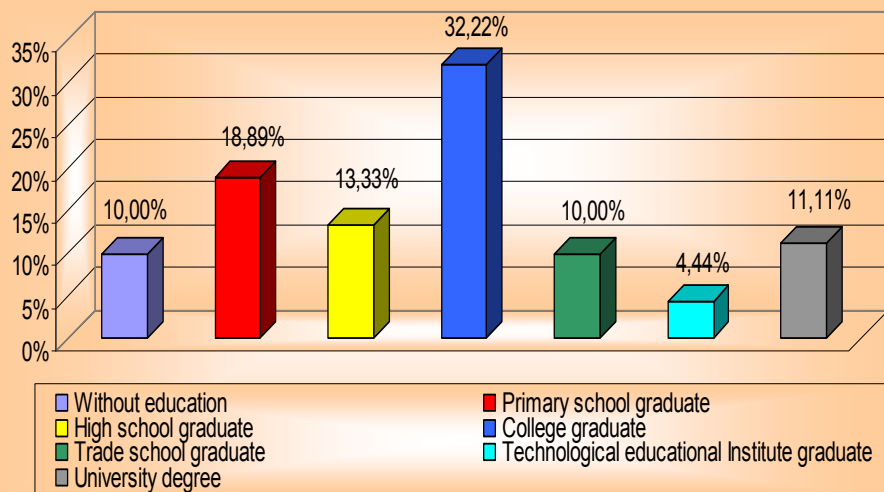
IDENTITY OF THE SURVEY

Nisyros

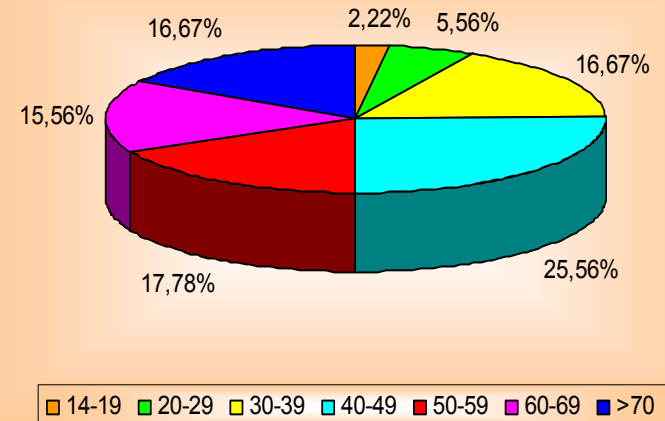
The chosen sample from Nisyros was 90 units and was representative of the population characteristics in every region, like



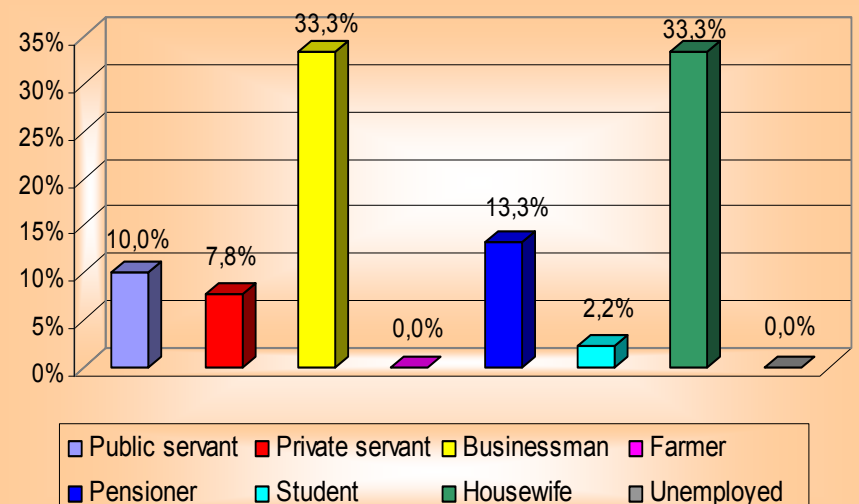
Education



Age



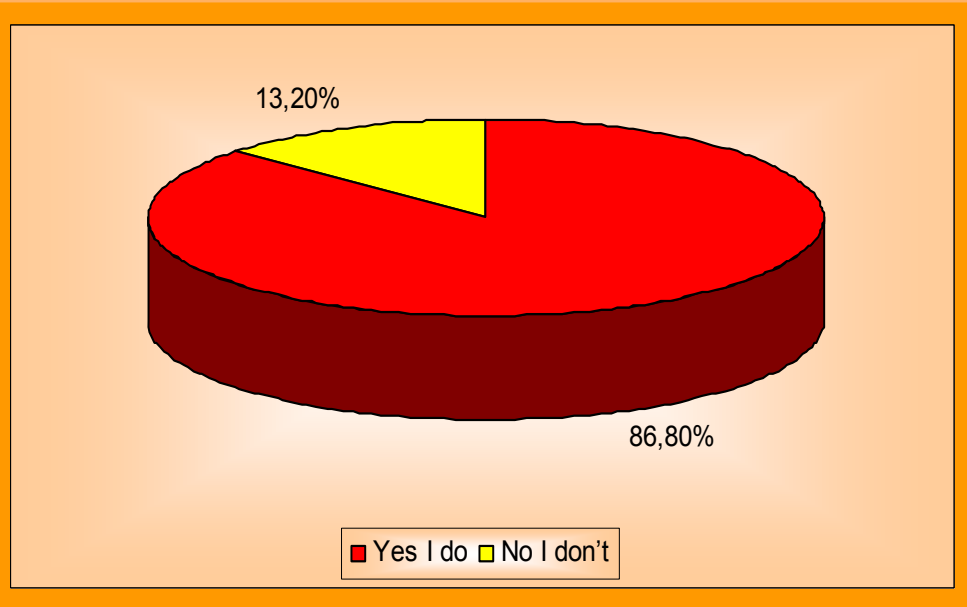
Occupation



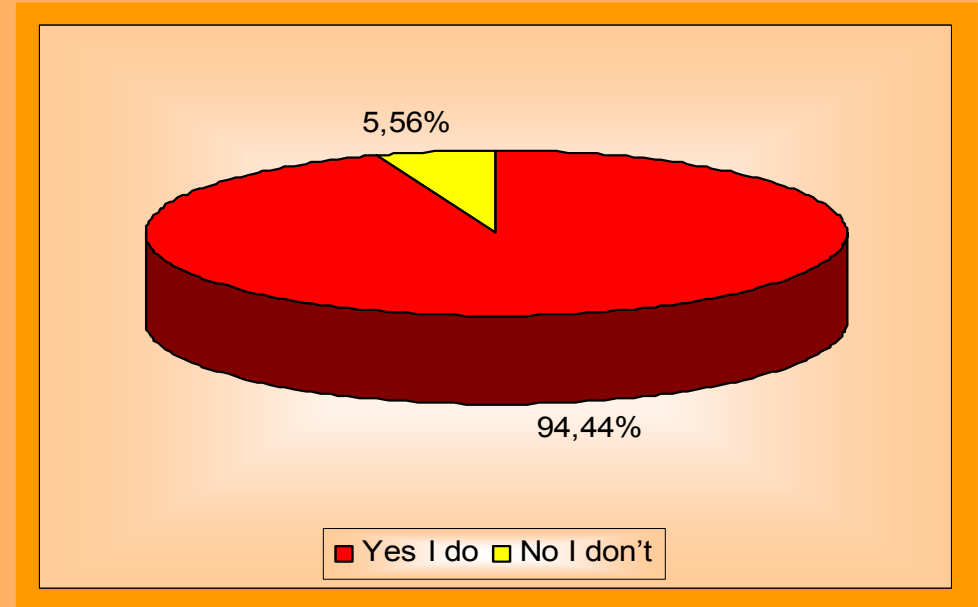
Survey results - Comments - Conclusions

A. Knowledge of local society about geothermal energy

Milos



Nisyros

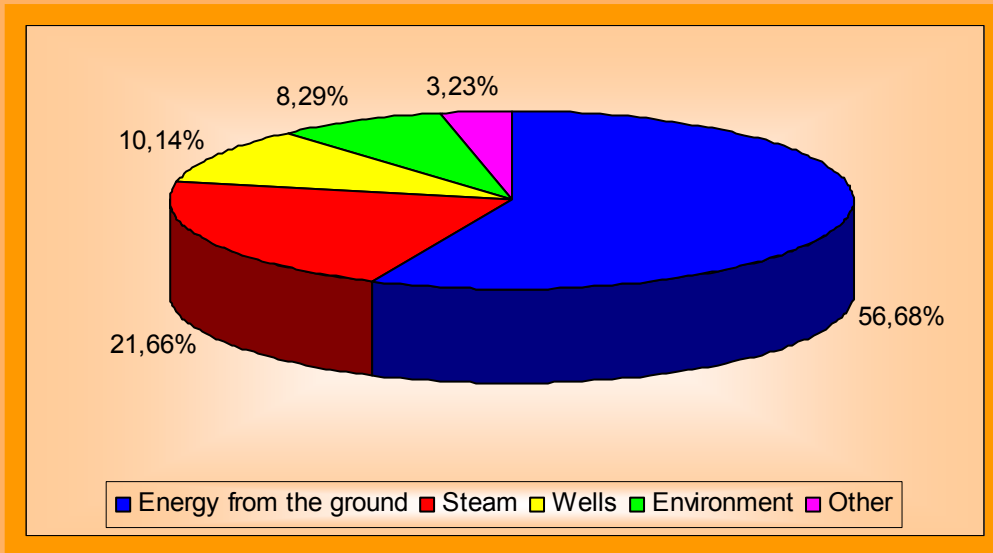


Local society knows about geothermal energy.

Survey results - Annotation - Conclusions

A. Knowledge of local society about geothermal energy

Milos

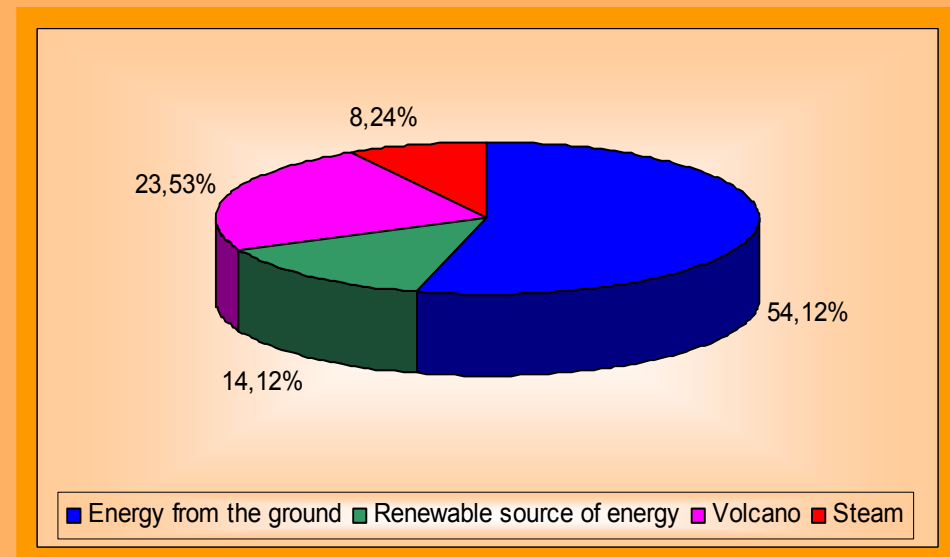


- Percentage higher than 75% answered that it is “energy from the ground” or “steam” and is presented in young and medium ages.
- Those who used the term of “wells”, it appear that they know, at least, part of technological side of the subject.

- Relatively similar stance by the proportional age-related teams.
- In Nisyros island, the sense of the connection of geothermics with volcanic action is, logically, much more intense.



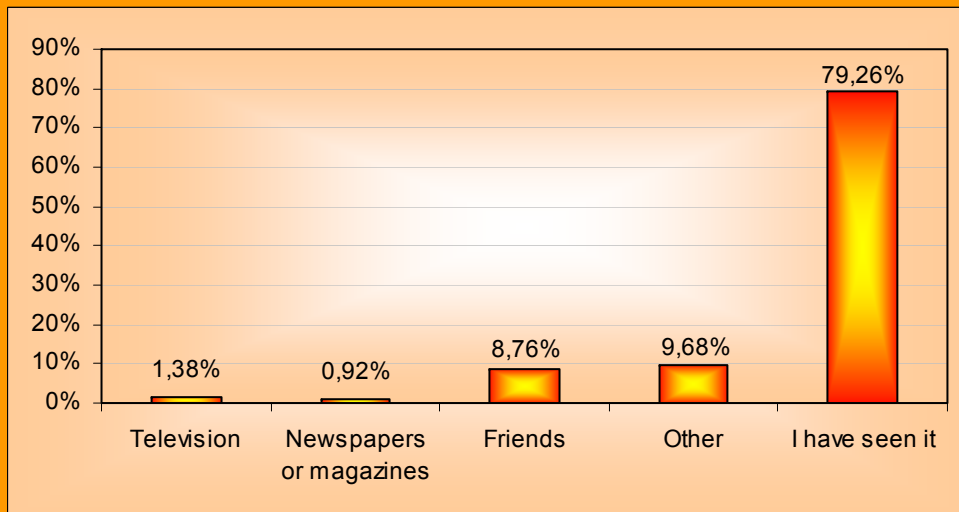
Nisyros



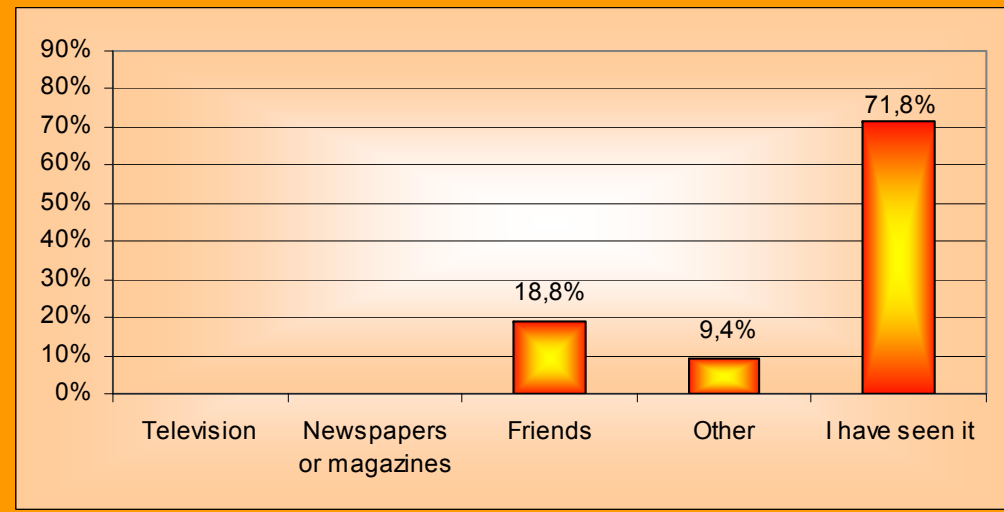
Survey results - Annotation - Conclusions


B. Sources of knowledge

Milos



Nisyros



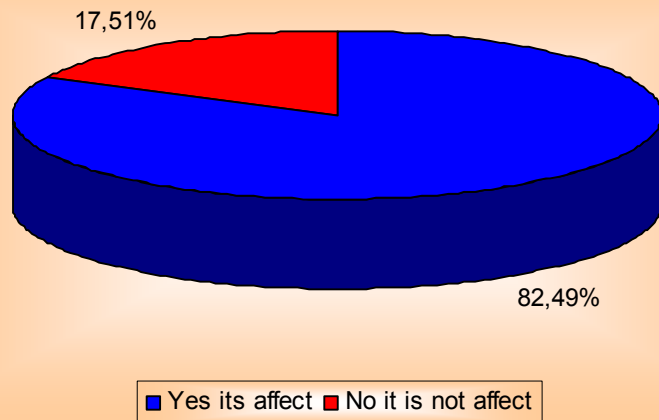
- The main source of information and knowledge of the people is personal experience.
- Particularly small the role of school.
- The media don't seem to provide any useful information at all.  It is associated with the non-existence of policy but also interest for interventionist action from the side of State in the sector of informing.

Survey results - Annotation - Conclusions

C. Geothermal energy and environment

Geothermal energy = Pollutant activity?

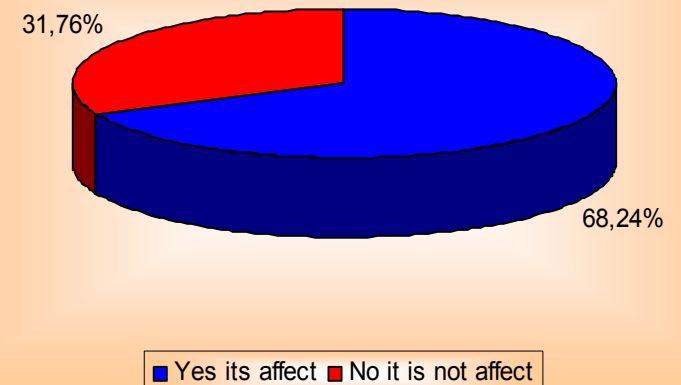
Milos



The overwhelming majority answers positively.

The younger ages present higher scepticism.

Nisyros



The majority answers positively.

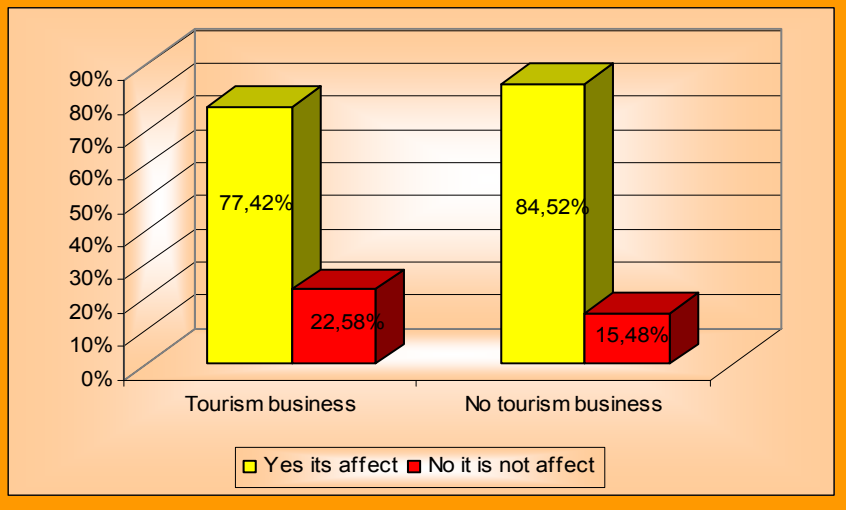
The younger ages (<30 years old) are positively encountered in their total, about environmental impacts.

Survey results - Annotation - Conclusions

C. Geothermal energy and environment

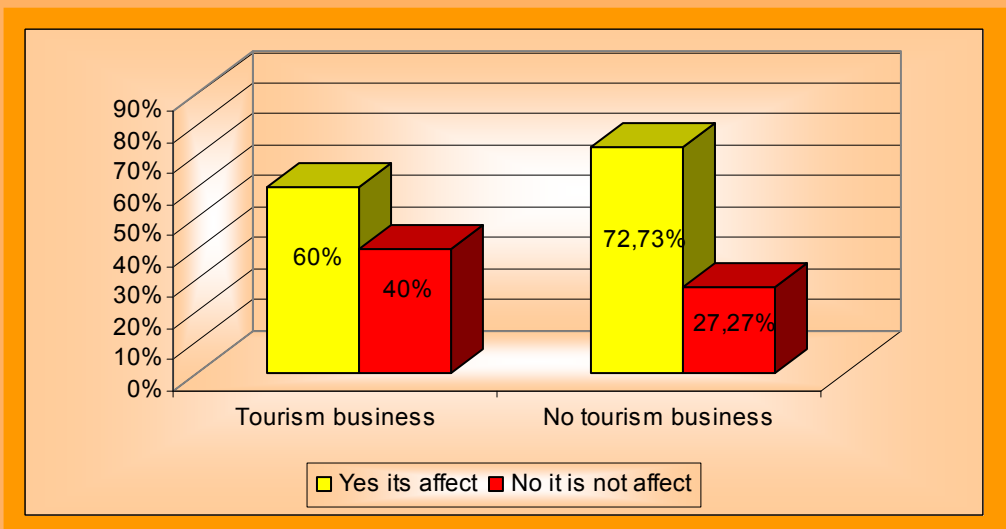
Geothermal energy – Environment and Tourism → Compatible actions?

Milos



It is not certifies a rousing environmental sensitivity and therefore the views that present negative confrontal against geothermal energy due to the tourism development of the island don't seem to be substantiated.

Nisyros

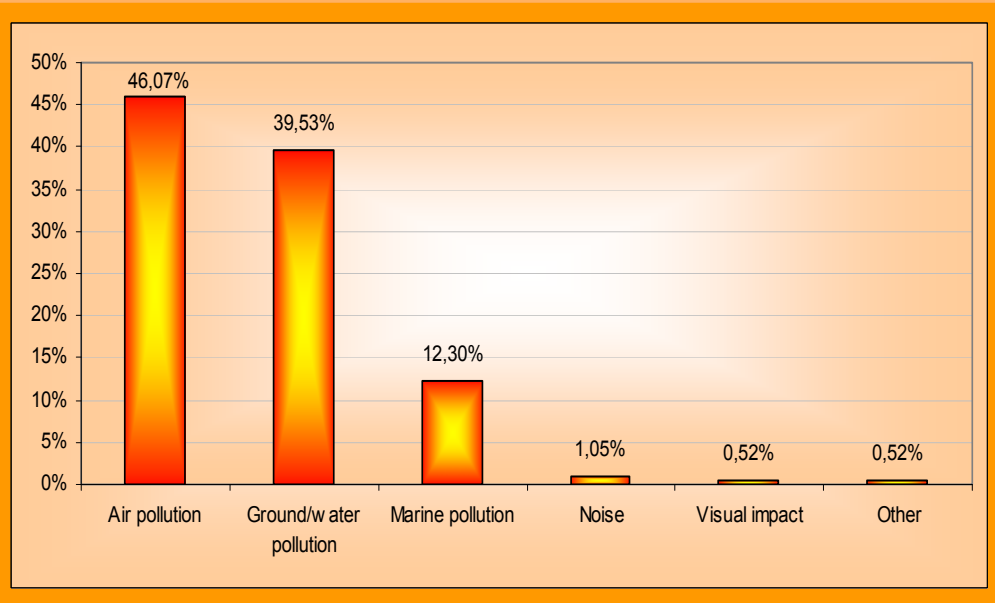


More intense environmental sensitivity for people that the tourism business is their main occupation.

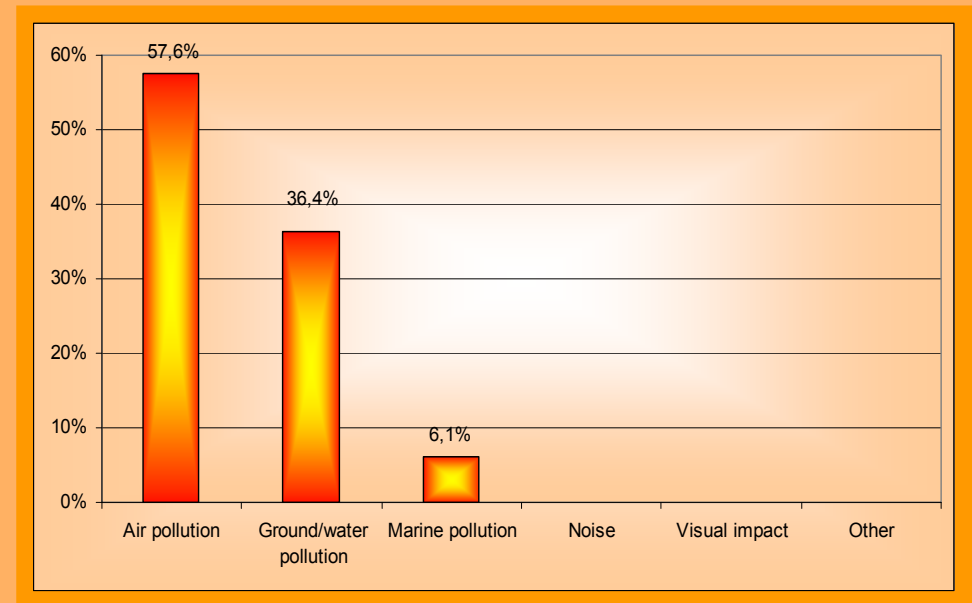
Survey results - Annotation - Conclusions

D. Environmental impacts of geothermal energy

Milos



Nisyros

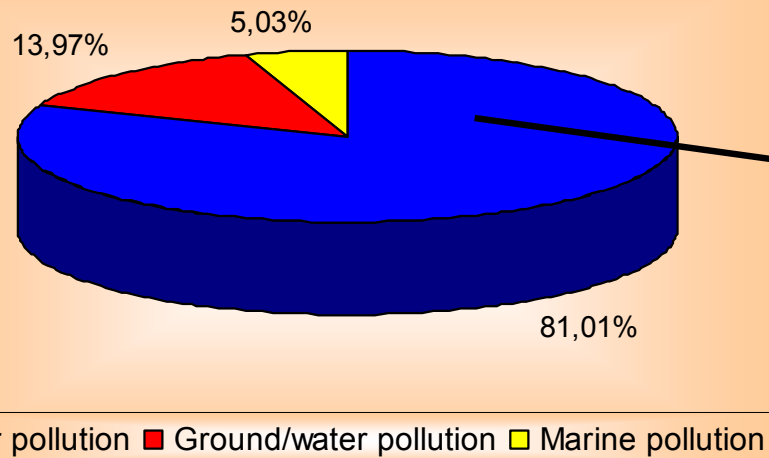


- The placement of local societies is explicit as for the problem of **air pollution** (M=46%, N=58%).
- Follows the **ground/water pollution** (M=40%, N=36%).
- With great difference follows the marine pollution (M=12%, N=6%).

Survey results - Annotation - Conclusions

E. Classification of environmental impacts

Milos

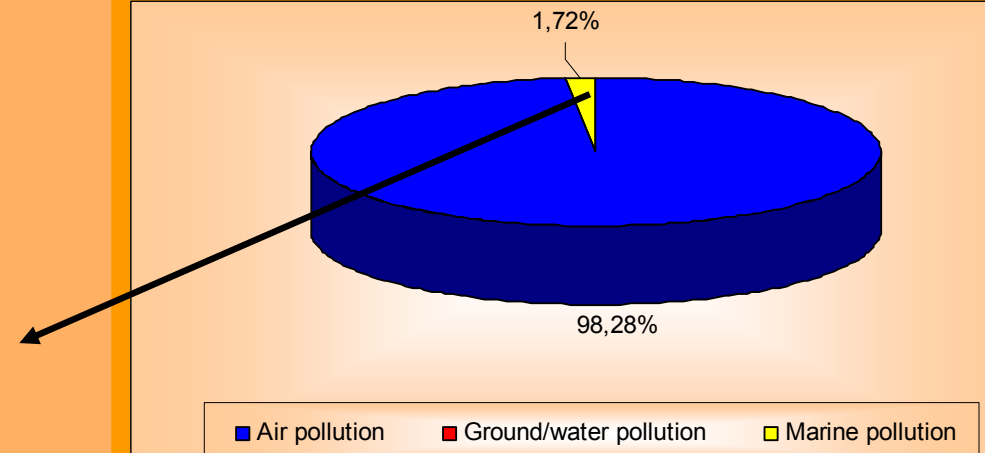


It absolutely dominates in young ages (<30). It is appreciated that despite the fact that the senior ages today have past experience, it appears to be also transported in the younger generations with proportional intensity.

Proportional and in particular in more intense expression the placement of residents of Nisyros island.

Only senior ages (>70) and especially women, indicate the marine pollution as more harmful for the environment.

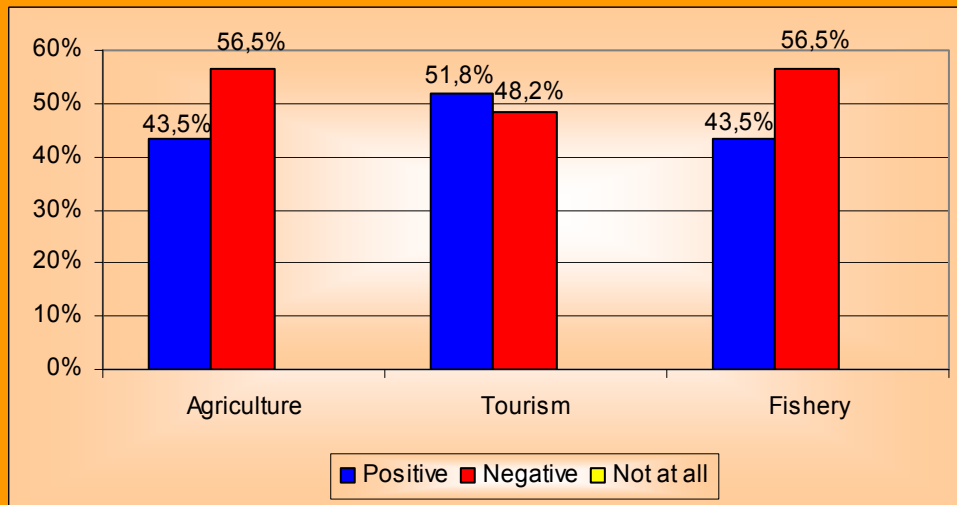
Nisyros



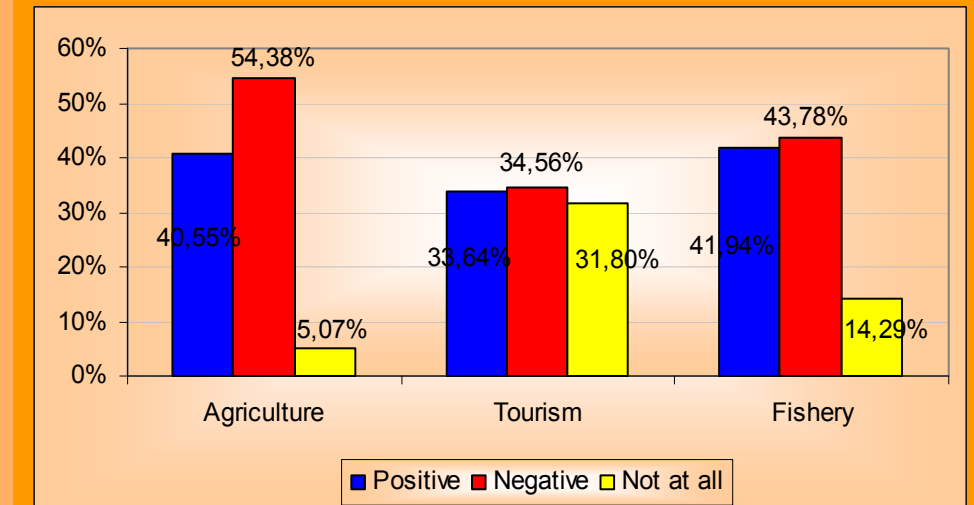
Survey results - Annotation - Conclusions

F. Effect of geothermal energy and its gravity, in the existing economic activities

Nisyros



Milos



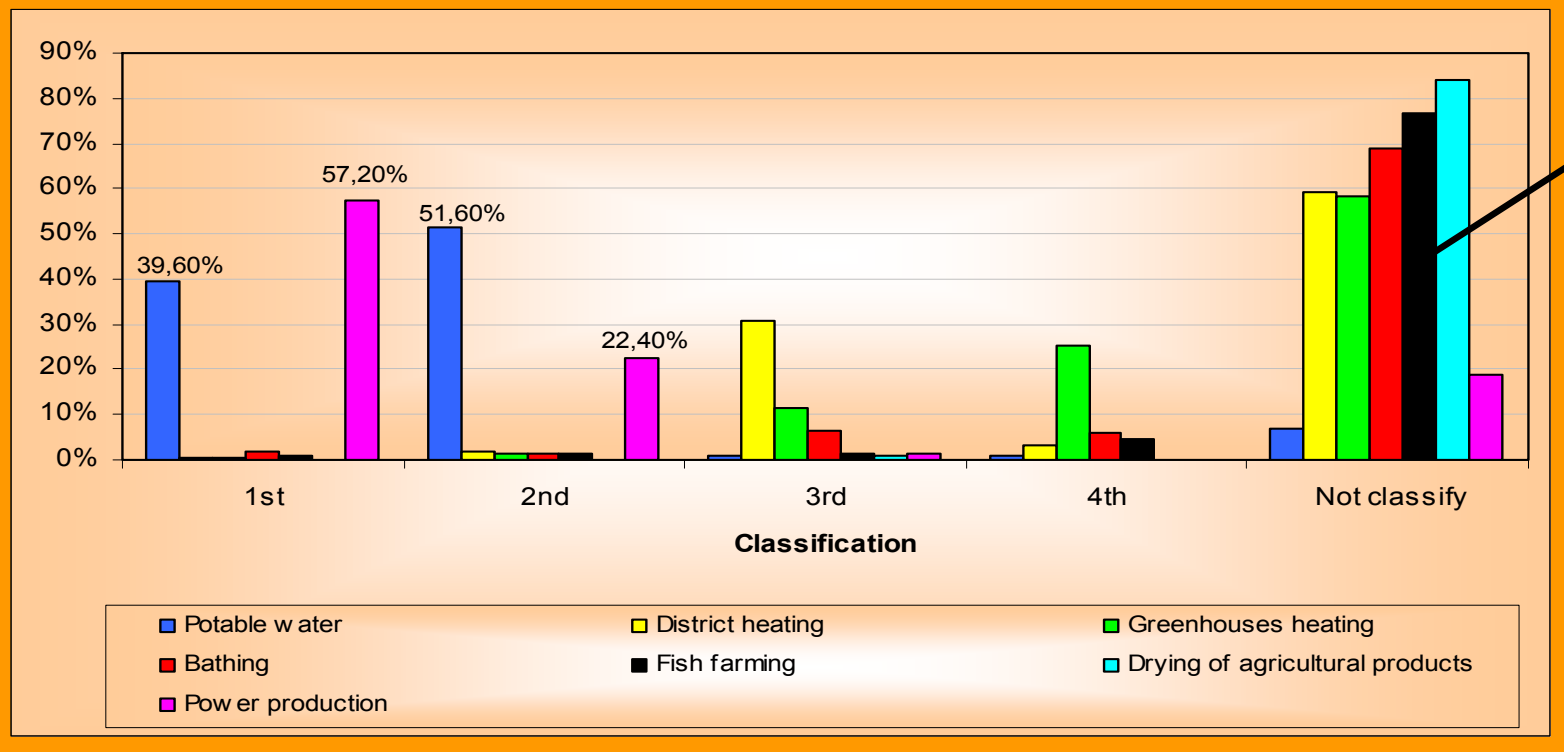
Contradictory placement, if it is combined with the answers on the environmental impacts and their classification

Tourism seems to be affected less despite the fact that the air pollution is counted as the most important problem in the environment.

Survey results - Annotation - Conclusions

G. Correspondence in new activities

Milos



?

Main Choices

1. Power production
2. Desalination

Senior ages (> 50 years old) → Potable water

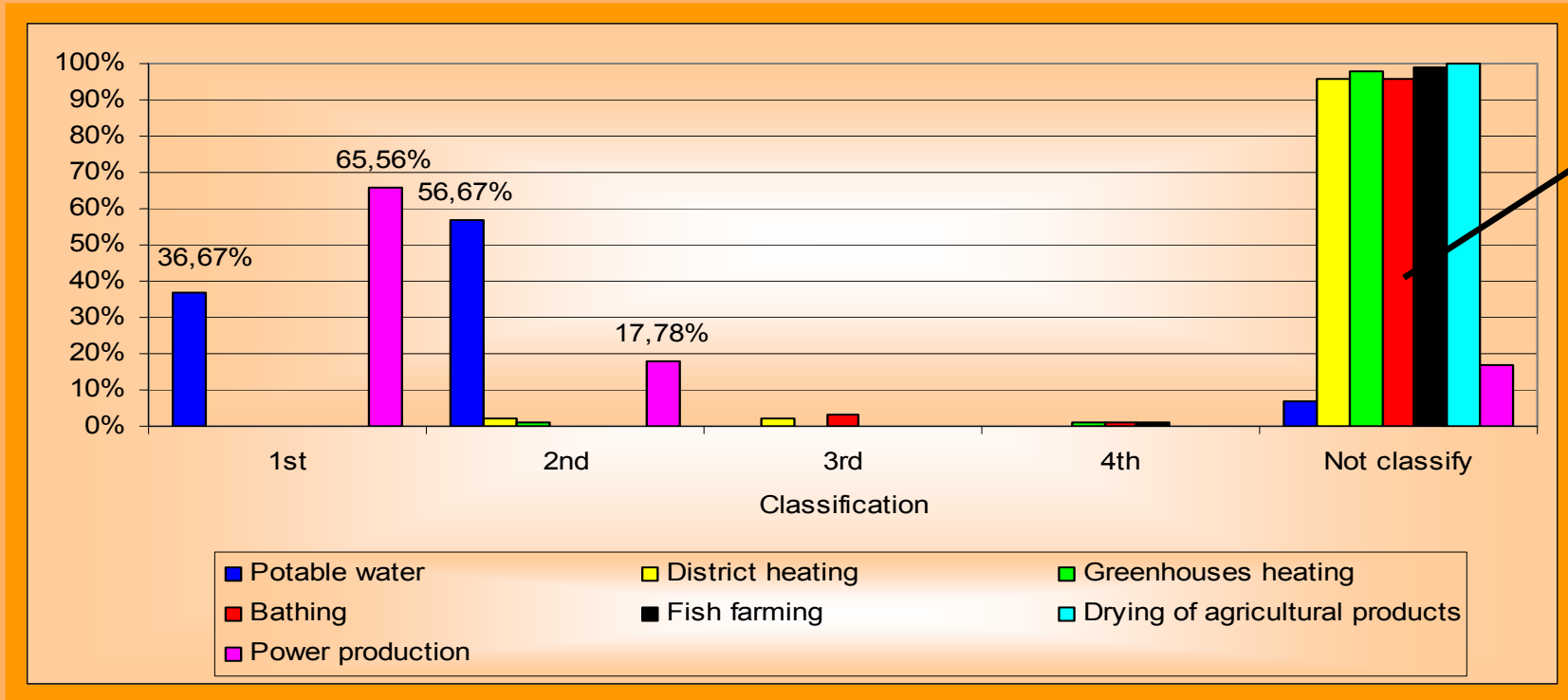
Young ages → Wider range of choices

→ Better knowledge

Survey results - Annotation - Conclusions

G. Correspondence in new activities

Nisyros



?

Single Choices

1. Power production

2. Desalination

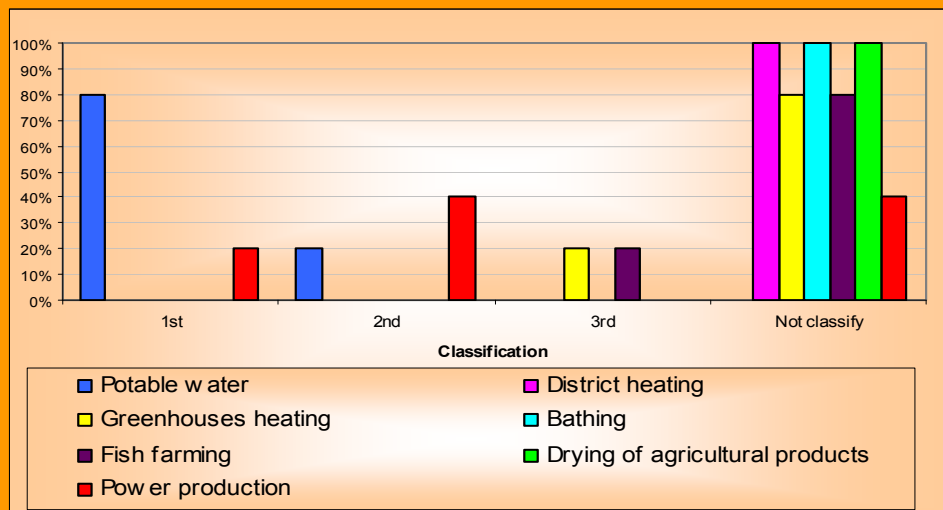
Complete ignorance of other possible applications and uses of geothermal energy

Survey results - Annotation - Conclusions

G. Correspondence in new activities

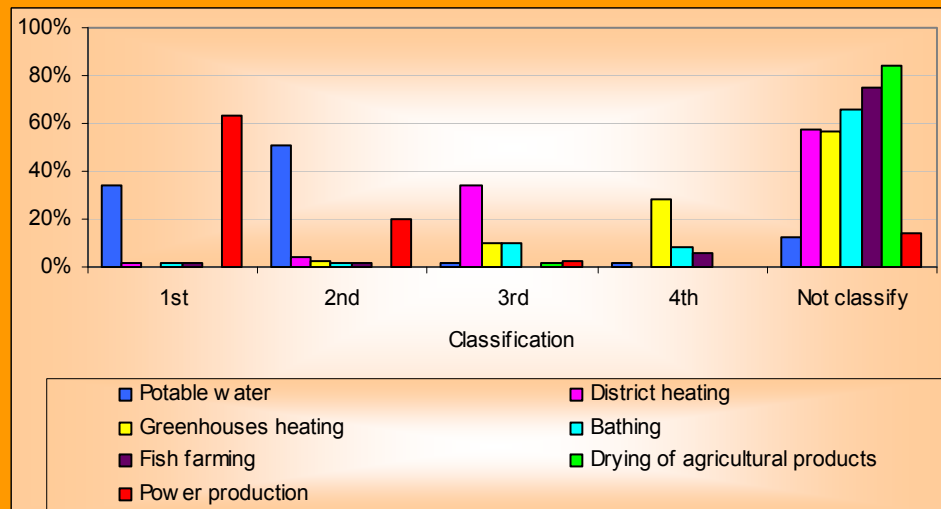
Is the choice of activities related to the object of employment of public?

Milos



The farmers, overwhelmingly, scorn uses that are related with their interests (drying of agricultural products – greenhouses heating).

Those who are dealing with the tourism are unable to associate applications, as the air conditioning or the spa therapy, with their enterprising interests.

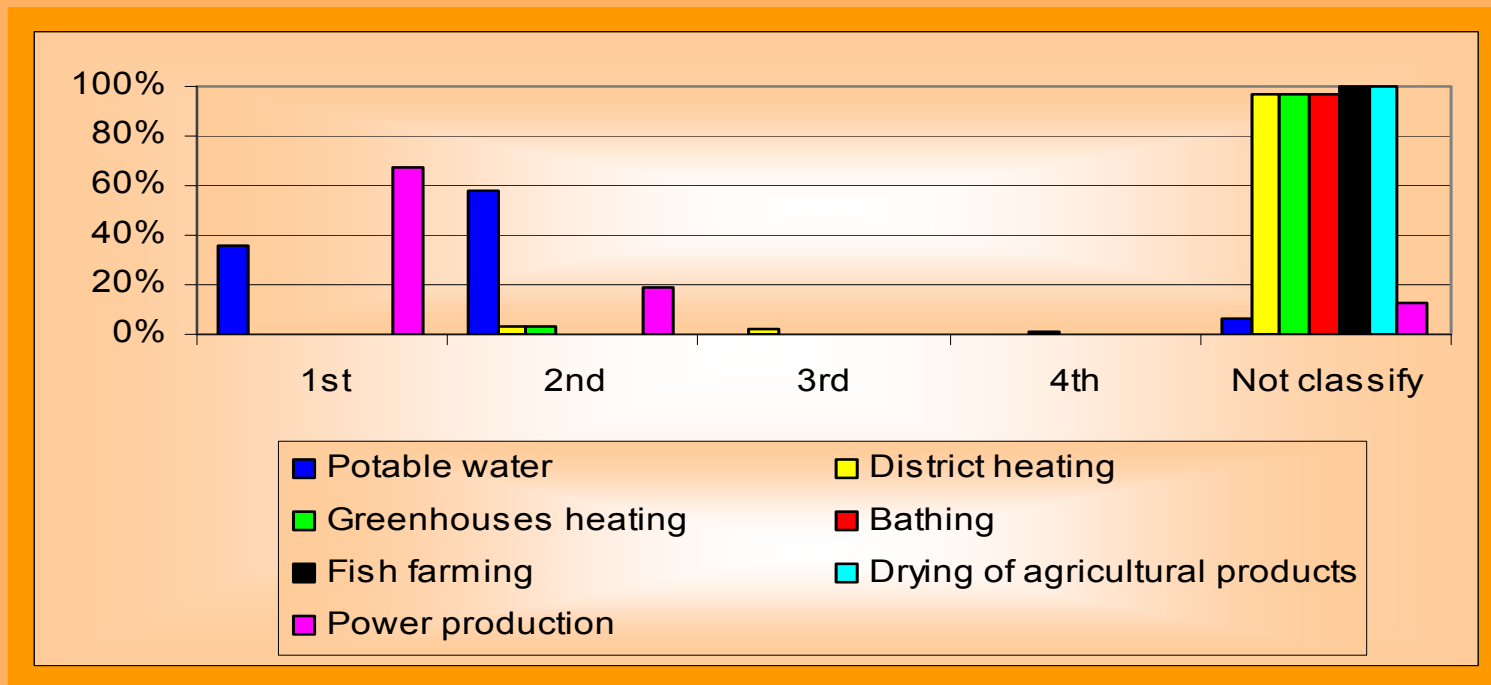


Survey results - Annotation - Conclusions

G. Correspondence in new activities

Is the choice of activities related to the object of employment of public?

Nisyros

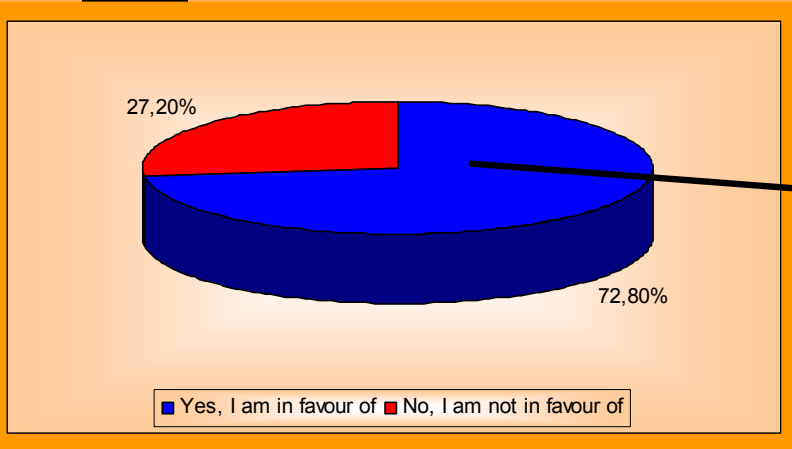


Proportional placement of those dealing with the tourism. Complete disdain, of applications that can contribute to the development of tourism and in the extension of "tourist" period for the island.

Survey results - Annotation - Conclusions

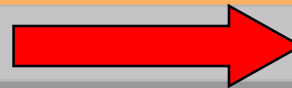
G. Correspondence in new activities

Milos



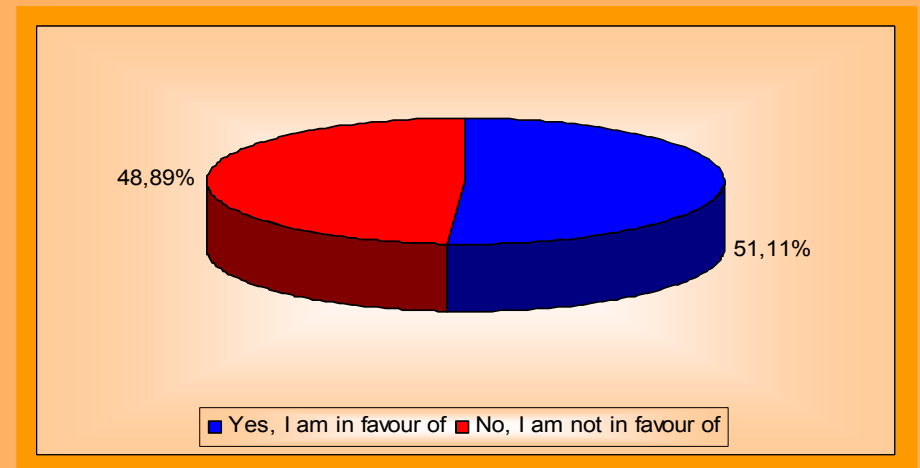
The great part of population which is positive, does not wish initiatives to be undertaken from the same institution that is connected with relative past actions in the island.

Positive correspondence in new applications



~~Pollutant activity~~

Nisyros



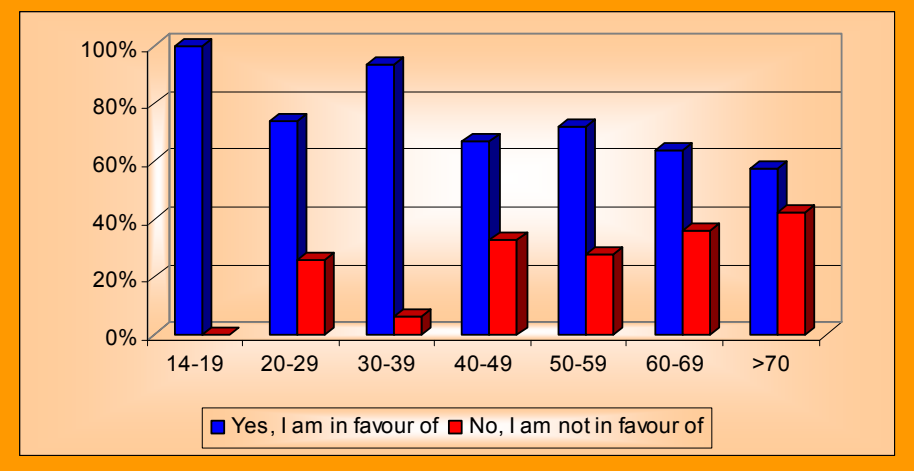
Almost levelled views.

Survey results - Annotation - Conclusions

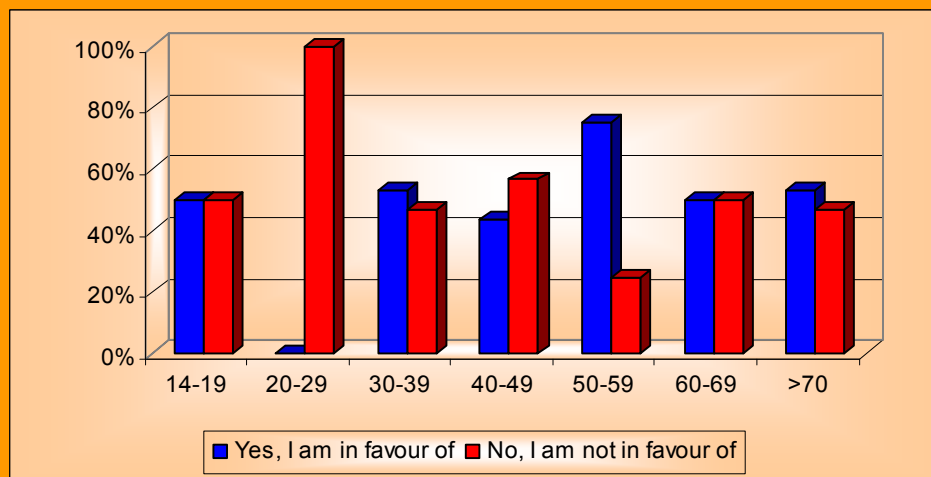
G. Correspondence in new activities

Milos

All group ages express themselves positively for the undertaking of initiatives aiming at the geothermal development in the island, in percentage greater than 70%. This positive placement is blunted in medium and senior ages.



Nisyros



The Nisyros public is presented more divided.

The productive ages are rather negative, the group age of 20-30 years old is vertically negative placed.

Survey results - Annotation - Conclusions

G. Correspondence in new activities

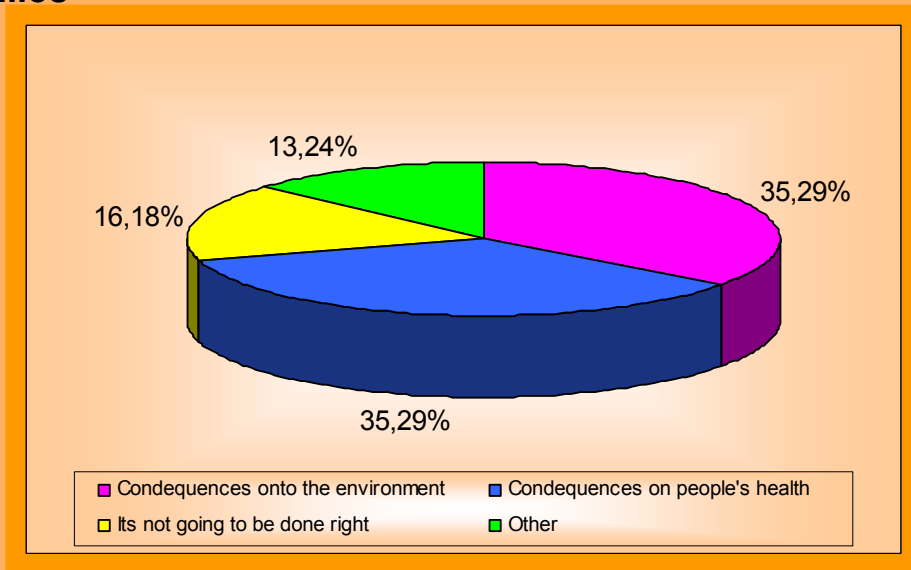
More important reasons of negative attitude



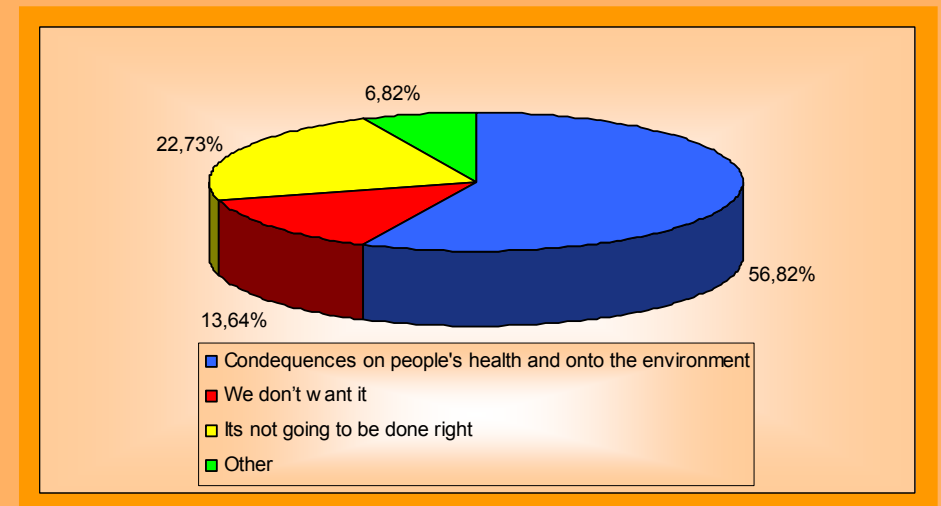
1. The consequences on people's health and onto the environment.

2. The weakness of right implementation of the project.

Milos



Nisyros



A major part of the public in both islands believes that the project will not be properly constructed. This view depicts the lack of trust towards the state authority and its representatives, as well as towards the ways of supervision and control of the project.

A part of local society of Nisyros is placed with the simple answer....*we do not want it...*

Conclusions

- The majority of Milos and Nisyros population is aware of the exact objective of geothermal energy. The main source of information and knowledge of people is their personal experience. The information by Media and school is practically non-existent.
- Main sources of environmental burden are considered to be the air and the ground/water pollution in both areas. The classification appoints the air pollution as most important as a result of personal experience.
- From all the usages that can come from exploitation of geothermal energy, the public selects those which practically reflect the every day needs (power production and desalination).
- The fact that the applications of geothermal energy in agriculture, fishery and tourism are not considered as choice from the public leads to the conclusion that the knowledge of the multiple and combined usages of geothermal energy and mainly of the low enthalpy is especially limited in the total of the local societies.
- In Milos, the public in a great percentage is in favour of the exploitation of the island's geothermal potential. The speculations about environment don't seem to affect the receptivity for total development of the area.
- The Nisyros public is presented divided in relation to their response in new activities.
- The lack of confidence in the Institutions that undertake the project, is the main reason for the opposition of geothermal development for the majority of the public.

Propositions

Methodical and well-founded enlightenment of local society

Geothermal energy and environment

Prospect utilization of geothermal potential and local economic activities

Integrated and model development of the islands- Benefits to local societies

Particular attention in “sensitive” categories of population

Senior ages with intensely their personal experience

Propositions

Re-establishment of lost confidence of public

Terms and conditions on the development of geothermal potential.
Attendance of local institutions in their configuration

Completion of institutional framework with the clarification of mechanisms of follow-up and control of (State and local institutions)

Encouragement of business dexterity of local population

Establishment of effective motives for the undertaking of enterprising action
(Central and Regional level)

Aid of role of Regional bodies in awarding licences for low enthalpy projects