



DESERTLINKS

**COMBATING DESERTIFICATION IN MEDITERRANEAN EUROPE
LINKING SCIENCE WITH STAKEHOLDERS**

CONTRACT EVK2-CT-2001-00109

DELIVERABLE 1.2a

A Report on the Stakeholders Perception on Land Degradation and Desertification in the
Mediterranean – DESERTLINKS Target Areas

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1. Introduction

“The last few decades have been characterized by an emerging public consciousness in regard to environmental issues”, nevertheless the Desertification phenomenon has not yet earned peoples’ attention, due to the fact of not having an immediate catastrophic character, as well as being difficult to identify in the field.

The genesis of this phenomenon is an important set of socio-economic and cultural conditions, both individual and collective, which are inserted in a value system in permanent change, and are responsible for attitudes and actions over a territory that is itself mutating (climatic change).

Therefore, one of the most important aspects to analyse, when studying environmental phenomena, is the one of perception. As Simoni & Allen (1998) say “...People interact on the basis of the meanings they assign to the world around them. Individuals respond to each other in terms of their perceptions...” and “...Even if people are “mistaken” in their interpretation of a situation, such interpretations, nevertheless, have a “real” consequences...”.

Following this idea, since the late 1960’s, a substantial body of literature relating to people’s perception of risk has developed (see review by Rohrmann 1999). However, most of the studies refer to perception of natural hazards, from which desertification has been excluded. The studies about perception are even considered, as mentioned by Gough (2000) “...an interactive process of exchange of information and opinion among individuals, groups, and institutions...”.

According to Slovic (1986), Fischhoff *et al* (1982), cited by Gough (2000) “... Much of the early work on risk perceptions concentrated on trying to develop linkages between perception and response in the belief that this would assist the development of risk communication tools that would make possible to “educate” the public or change their perception of risk to make them closer to expert perceptions...”.

The community involvement, after knowing its perception on desertification, will definitely be more effective and allow a broader responsibility mitigating the phenomenon. Thus, a good information strategy about desertification can be constructed, which is truly relevant for the affected community.

On the other hand, being also an extremely important aspect, knowledge of the perception can provide information on facts and elements, which were not equated, after Rogers (1997) “ Thus people’s perceptions of the risks are informed by a number of factors that may not seem relevant to experts making technical

assessments of the same risks and individuals and communities respond to risk and risk information according to their perceptions and understanding of the risk, though the links may be complex”.

Studying stakeholders and general public perception about desertification, two objectives were at aim, the way the phenomenon is understood and, simultaneously, to integrate stakeholders as partners in the decision making process,, in a reciprocity approach. This wise, and despite many methodological differences, this approach was carried out in the four target areas, for which the results are presented.

It is important to mention that this process, started in many countries, is far from conclusion, but we can certainly state that, so far, the workshops have been and excellent method to establish communication for on-going dialogue between experts and stakeholders.

2. Case Studies – Target Areas – Portugal - Alentejo (Mértola Municipality), Spain (Guadalentín), Italy (Agri Bassin) and Greece (Lesvos I)

Due to its complexity, the Desertification phenomenon is of difficult perception to the common citizen, and often to affected populations. However, this fact does not mean that people do not have a notion about the degree of degradation soils and the ecosystems are in, nonetheless they do not directly relate this situation to the term and concept of Desertification.

In reality, society has been informed about this grave environmental problem through the media, and constructed an “image” based in the issued information, especially during drought years or when, for political reasons, it becomes convenient to use the term Desertification, even if the use of the word is clearly away from the underlying concept.

This wise, following the studies carried out within the frame of EU financed research projects, like Desertlinks about Desertification in Portugal, with a particular incidence in the Mértola – Lower Alentejo Region, it was important to have a clear notion of the public perception on Desertification. In fact, the understanding and image of this phenomenon can all too easily jeopardise mitigation actions, but it can also reveal clues and guidelines for future actions and dissemination measures.

Consequently, the objective of this study is to convey the results of a questionnaire to assess the views of the communities living in affected areas, as far as the desertification phenomenon is concerned, as well as knowing which are the country’s most affected areas. The target areas are located in four signatory countries of the UNCCD (Annex 4), where there is a Focal Point and a National Plan to Combat Desertification already released, thus it becomes pertinent to discern if people know about this plan and which ministry is responsible for its implementation.

- **Methodology and Types of Approach**

The method adopted for this analysis was a questionnaire with 12 questions, and a Stakeholder Focus Group Workshop.

The questionnaire was structured on direct questions, to know the profile of the subject (gender, age, literacy), about the national plan, and choice answers about how people had known about the concept, to which factors they associated Desertification and which ministry was responsible for the plan and its application. The factors people associate Desertification with were chosen from the answers to a previous questionnaire, made to 500 individuals. The questionnaire was applied in the four target areas to different group sizes, in relation to the realities of each country and the divulging efforts and mechanisms used by each team.

The objectives of the **Stakeholder's Focus Group Workshop** were:

- To identify desertification impact in already affected areas and those most valued functions being threatened by desertification;
- To identify candidate impact indicators arising from the perception of desertification and its impact on land function (such as loss of biodiversity, sedimentation, reductions in crop yield);
- To identify the needs for information from the scientific community, especially from a desertification indicator system;

Although there was a pre-established methodology for conducting the workshops, based on the objectives to be attained, these workshops were conducted with significant differences within each other as far as number of participants and types of stakeholders is concerned. This is due to the specific social and economic realities of each target area. Nevertheless, it is worth mentioning that there has been a constant and common effort to involve the right agents at the decision-making level as well as the representatives from local communities and civil society in general.

2.1 PORTUGAL – Alentejo – Mértola Municipality

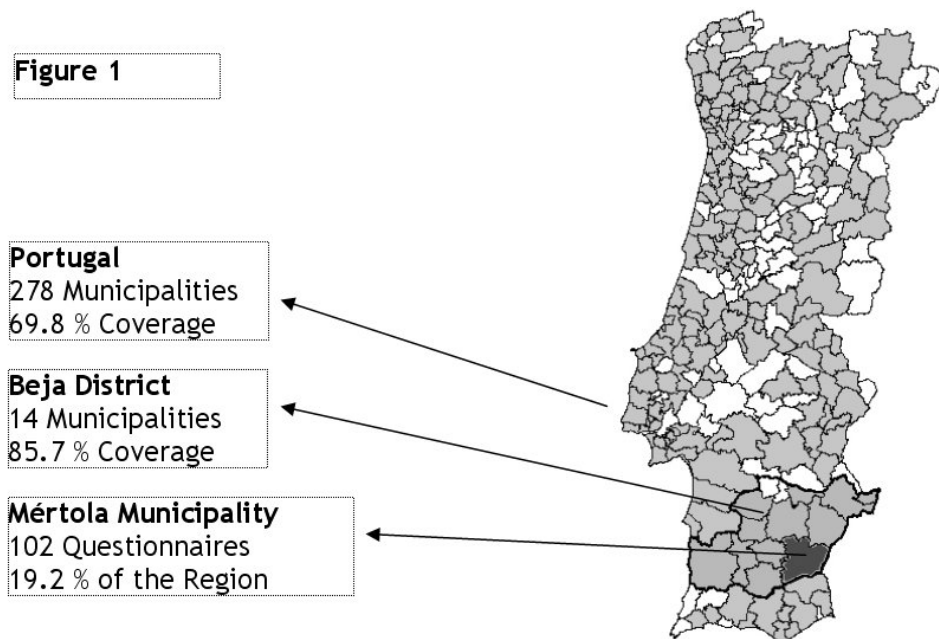
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2.1.1 – Questionnaire on the public perception of desertification

The questionnaires were sent to basic and secondary schools all over the country, through the Geography Teachers Association (AProfGEO) monthly national mailing. The questionnaires were added to the mail, addressed to the Geography delegate of each school, which copied and launched them through the students and families. This way it was possible to obtain a wide range of inquired people, although a larger portion of answers from young people of learning age is understandably expected. This fact, which could be considered a limitation, manifested an important aspect, knowing the perception of young people, which in theory should be better informed through materials taught in various disciplines.

The adhesion to this exercise was quite surprising, 7112 questionnaires were received from schools, coming from 70 % of the country's municipalities. The main reason for this very high level of answers must be because the questionnaire is related to an environmental issue, fully framed by subjects lectured in Geography disciplines.

With all the information available, a three scale analysis was possible (Fig. 1), Portugal, the Beja District, and the Mértola Municipality. The objective was to evaluate if the perception in the target area is different from the overall country perception, as the Lower - Alentejo is the most mentioned area in terms of Desertification affected areas.



The profile of the inquired people, on the three scales of analysis, shows a clear predominance of the 15-25 age class, which in terms of education degree is substantiated by the dominance of the third cycle and Secondary. This fact is directly related to the means used to implement the questionnaire, but on the other hand enabled the knowledge about the opinion of this stratum of the population which has, by far, access to a larger range of information sources. Only the Mértola municipality has a larger percentage of answers from older people, but this is because it is an interior area of the country, with high immigration rates and an aged population. This fact also justifies that both Beja and Mértola present the higher levels of individuals only with primary school or even illiterate (Fig. 2).

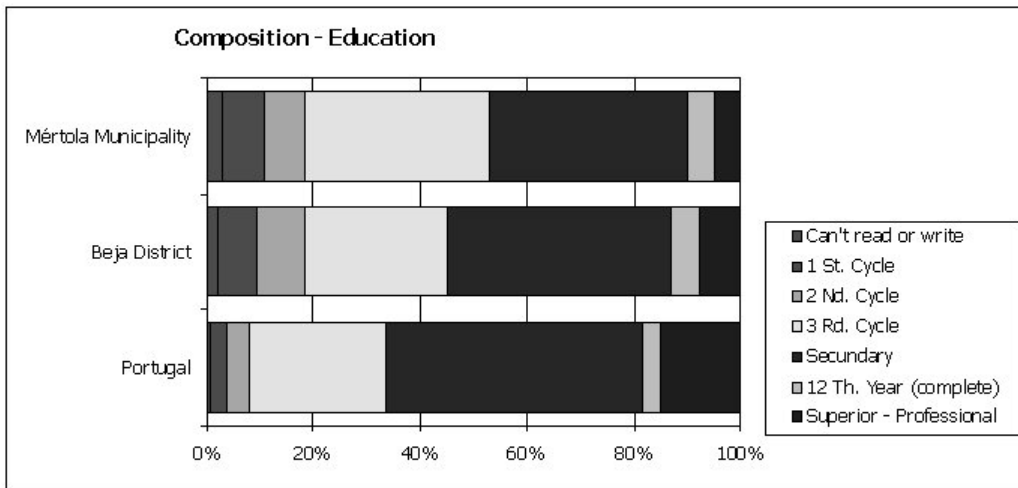


Fig. 2

In terms of questions, the first conclusions are the following, on if people had knowledge about the Desertification phenomenon; there is a large predominance of yes, with values higher than 80 % in all the three scales of analysis. This result is, to some extent, expectable, as the term Desertification is frequently used, both by politicians and the media. As a result, the information sources more mentioned are also not a surprise, mostly television and the written media (newspapers, magazines) (Fig.3). The low importance of the Radio is noteworthy and justified by the limited broadcasting time for news and debates about environmental issues and problems.

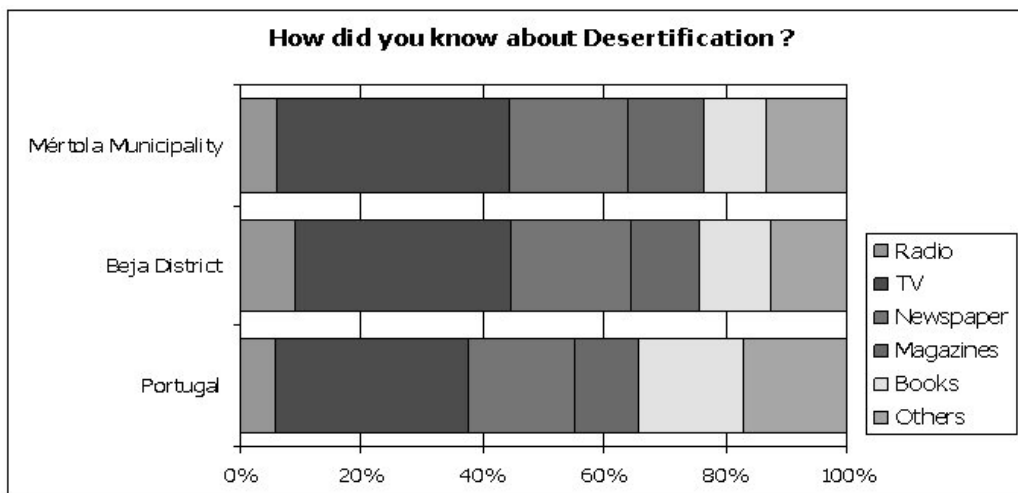


Fig. 3

One of the most important questions, revealing of the perception about the phenomenon, was about the phenomena or factors associated with Desertification. The results for Portugal, the Beja District and the Mértola Municipality can be seen in Figures 4, 5 and 6. At national scale Desertification is mostly associated with depopulation, unemployment, poor accessibility, deforestation, droughts and, last with some weight, soil erosion, lack of water and advance of the deserts (Fig. 4).

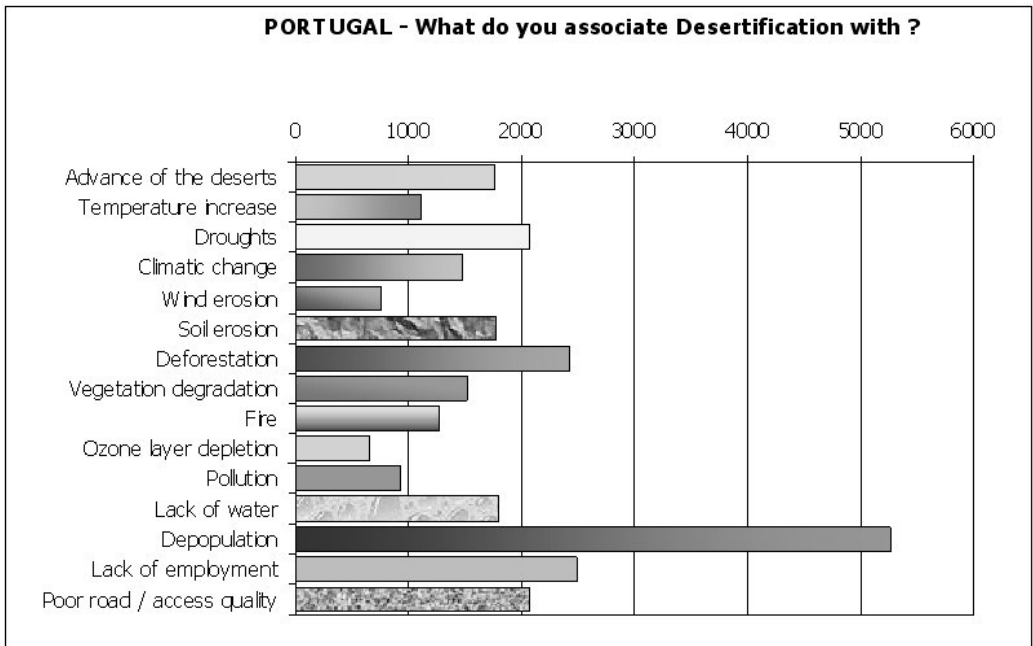


Fig. 4

In the Lower-Alentejo, Beja District, the image is very similar to the national one; there is just a larger weight on the association with depopulation and unemployment. The other references continue to be: droughts, deforestation, lack of water and advance of deserts. Nonetheless, it is important to note that droughts have a larger emphasis than at country level, which could be explained because the Lower Alentejo is a region subjected to this type of extreme climatic event (Fig. 5).

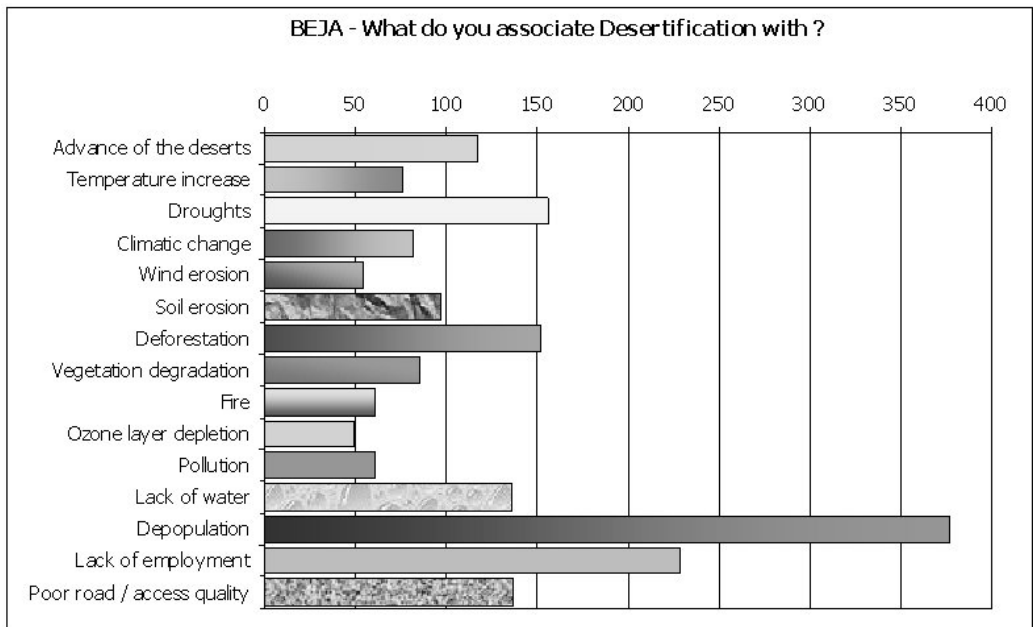


Fig. 5

The perception of the people living in Mértola is very similar to the former ones; yet there is an increase in the importance of deforestation, advance of deserts and lack of water (Fig. 6).

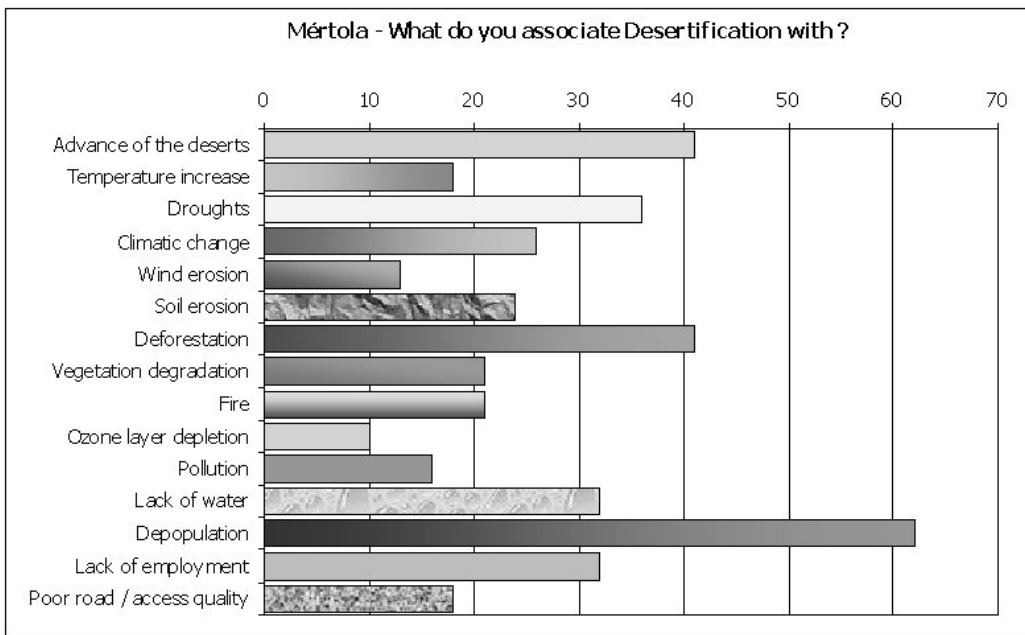


Fig. 6

Another important aspect was to know the areas the general public considered as most affected by Desertification. Again the answers were globally very similar. There is no doubt that the most affected area for everybody is the Alentejo and the interior of the country, which brings a particular sense to the earlier answers. The Alentejo and all the interior stretch of Continental Portugal have witnessed, over the last decades, significant population decreases, and consequence of their low development rate.

A curious fact is that the people in Mértola referred more the South, because of its proximity with the southernmost areas of the country. In the light of Portugal's geographic reality, the references to the North are less understandable, but truth is that according to the general perception this region of the country is also affected by Desertification (Fig. 7).

The existence of a National Plan to Combat Desertification (NPCD), since June the 18 Th. 1998, where a set of measures and mitigation actions were delineated, motivated the last questions, to evaluate do knowledge about the document and the ministry in charge of its implementation.

The results were clearly elucidative, more than 60 % of the people inquired, at a national and regional scale, state that they do not know the NPCD. This percentage increases to 79 % in the Mértola Municipality, considered as one of the country's areas more affected by Desertification. As expected, the knowledge of any particular action from the NPCD is almost total; more than 90 % of the inquired people say they do not know any action in the NPCD.

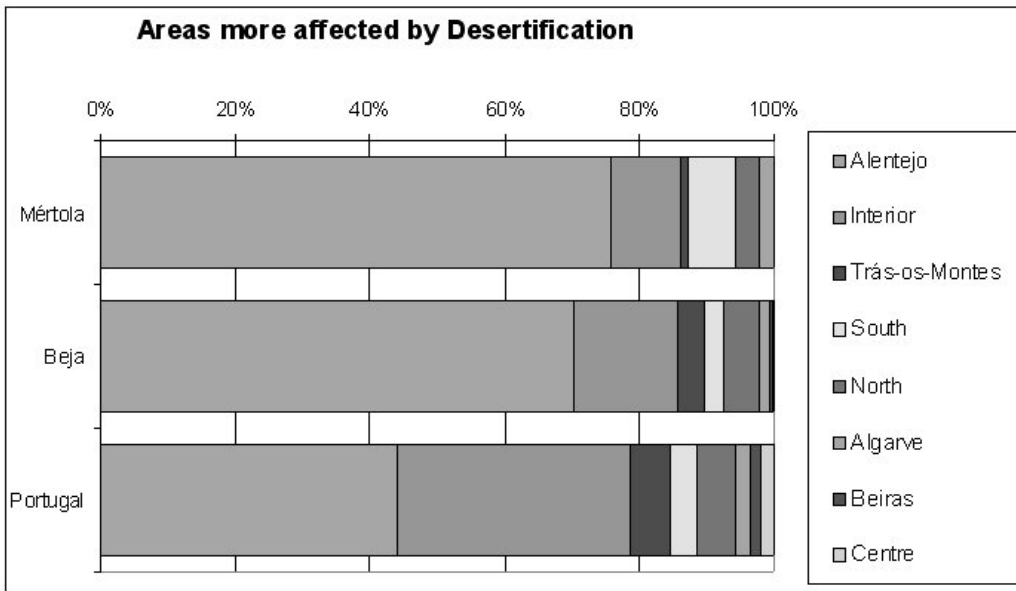


Fig. 7

The question about the ministry responsible for the implementation of the NPCD was answered only by 42 % of the people. The ministry of the environment is, by far, the most cited (Fig. 8). The importance of the ministry of agriculture increases towards more rural areas, on the contrary the reference to Land Management and Territory decreases from urban to rural.

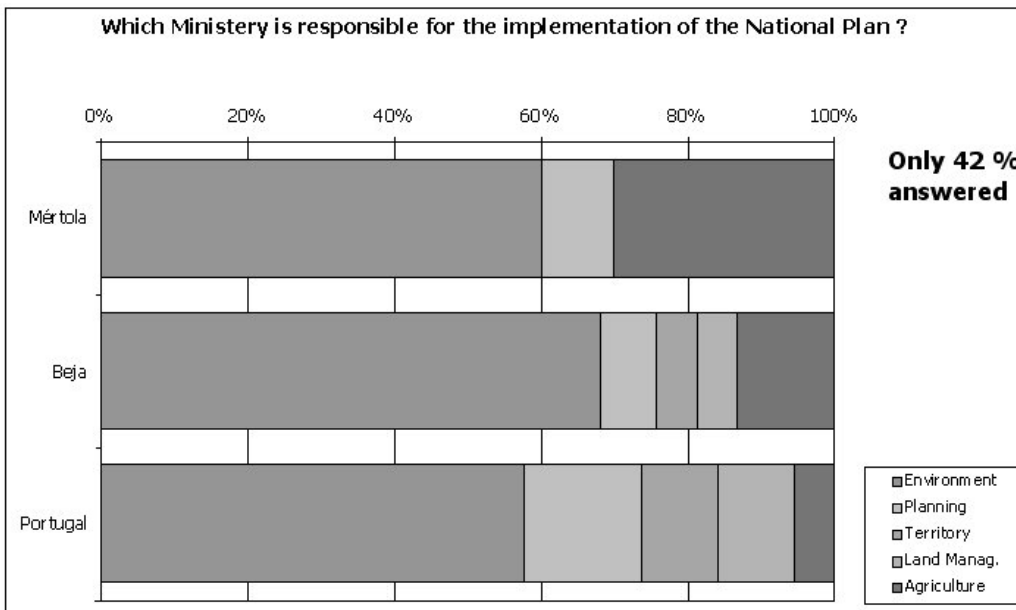


Fig. 8

As demonstrated, the perception that the general public has on the Desertification phenomenon is far from corresponding to the real problem. Furthermore, an important fact is that even in the Alentejo and in Mértola in particular, the results obtained are even more elucidative and surprising, as at a national scale this region and this municipality in particular are frequently mentioned when talking about Desertification.

The first conclusion is that the population, living in areas that already show evident signs of land degradation, associate Desertification with depopulation, instead of the present situation of productivity loss and consequent decrease in ecosystem biodiversity.

When dealing with such a complex phenomenon as Desertification, which doesn't present an immediate catastrophic character, and whose consequences are difficult to identify in a landscape (only in a very advanced state), or to evaluate economically, it is essential to understand and know the image individuals have. This is the only mode to envisage a better way to inform and implement mitigation actions and measures.

However, it is also necessary to understand how the existing "image" of Desertification was acquired, which was the medium of the information and the contents that contributed to its formation. It is known that in nowadays society the Media play an extremely important role in the dissemination and transmission of knowledge to the common citizen, and in this context the questionnaire clearly pointed out both television and the newspapers as the main sources of information.

Therefore, the reasons for a large part of the perception that people have about Desertification results from information and news, transmitted by the mass media, but which didn't actually constitute a "treatment" of the Desertification subject. Through the analysis of news in several national and regional newspapers, from 1980 until the present, it is possible to observe and realise that the term Desertification has been most of the times wrongly used. Especially during election campaigns, in political speeches, meaning almost always land abandonment, for poor conditions of life, isolation and lack of employment opportunities.

The news and articles exposing Desertification phenomena correctly are rare, they "occur" mostly during drought periods, but even in these situations this serious environmental problem fades away and ceases being news and in the news. However, the information issue is a crucial aspect to consider in the future, even more so the more frequent is the use of natural resources in an irrational manner. It is fundamental that science becomes truly applied and useful to society, that's why a larger contact between research and the media should be promoted, to allow for more precise and scientifically correct information.

To combat Desertification and succeed with the mitigation measures and actions implies a full knowledge of the general perception about the phenomenon, as well as developing strategies and methods enabling an effective and quality broadcasting, of both its causes and consequences.

2.1.2 – Stakeholders Focus Group Workshop – Mértola , 12 de April de 2002

The workshop took place in ADPM's (Associação de Defesa do Património de Mértola) headquarters, on the afternoon of the 12h of April. Around 50 participants were chosen, politicians (12%), farmers (27%), technicians (44%), NGO's and citizens (17%) – Fig.9.

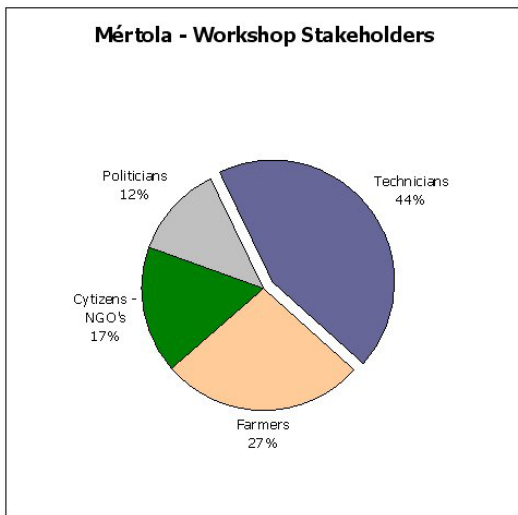


Fig.9 - 56 Stakeholders invited, 42 attended

Organisation Committee: Focal Point - Regional Sub-Commissions, Municipalities Environmental Institutions, Two DESERTLINKS members were present.

The objectives of the workshop were, "Identification of Desertification Signs and Solutions". Methodology based on **European** Awareness Scenarios, with the collaboration of an expert team coordinated by Prof. João Farinha (UNL).

Methodology:

- Support document, invitation and programme delivered to participants;
- Session starts during lunch, each two participants choose two signs;
- Participants are divided in 3 working groups. The signs proposed by each group of two participants are voted inside each working group, each participant has 5 votes to distribute;
- The pairs are joined in groups of 4 people and each of these groups has to discuss and decide solutions, partnerships and barriers for each of the most voted signs of Desertification;
- Afterwards, each group has to draw a poster about the conclusions and issues each group discussed (Fig.10 and 11);



Fig. 3 – Working group



Fig.4 - Poster

- All the groups gather for a plenary meeting, each group of 4 chooses one element to present the poster;
- After the presentations, every participant in the plenary votes for the posters (5 votes each person); (Fig. 12 and 13)
- In the last step, every participant subscribes one of the most voted actions, in order to create accompanying groups for the priority measures defined in the workshop.



Fig.12 Presentation in the plenary



Fig.13 - Voting for signs

Example of signs voted by sub-group A

SIGN OF DESERTIFICATION	P	T	F	C	A
A1. Depopulation – continuous exit and gradual ageing of the population.	6	9	8	0	23
A2. Soil erosion (mainly due to the action of human activities and climate, wild fires, poor immediate reforestation and crops inadequate to soil types).	8	13	1	0	22
A3. Lack of investment.	5	2	8	0	15
A4. Agriculture techniques inadequate to soil types.	0	7	4	0	11
A5. Scarcity of water, bad use of existing water lines.	1	6	3	0	10
A6. Geo – Agro – Environmental unbalance (lack of trees and dry weather).	0	3	1	5	9

The next Figure 14, clearly shows the range of different perceptions among stakeholders, in relation to the factors that lead to desertification. Common citizens associate the word desertification to social phenomena such as depopulation (so called “human desertification”). Specific stakeholders, such as regional and local politicians with responsibilities in land resources management and territorial planning, also associate desertification with population losses, peripheral or marginal conditions for investment and economic development, paying little attention to the implementation of agricultural policies, and not recognizing the role of climate, soil conditions or management practices.

As expected, farmers and technicians, when asked about desertification, they give particular importance to issues such as soil erosion and agricultural techniques. This is extremely relevant as it allows a more effective dissemination and implementation of mitigation measures.

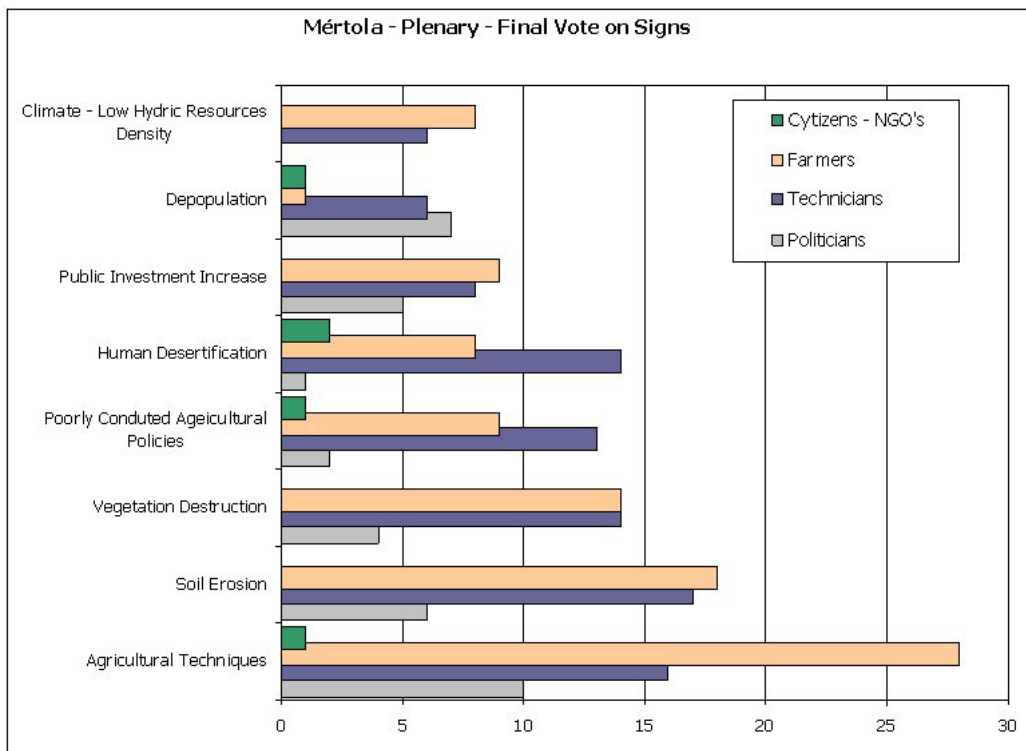


Fig. 14

Workshop results were fundamental for the desertification perception analysis, and they lead to the identification of the stakeholder's main worries and possible solutions to specific problems, in order to minimize the consequences of the desertification phenomena.

1. Human Desertification

2. Agricultural Techniques

Clues for solutions

Clues for solutions

- Demographic diagnose
- Local economy increment, based on traditional goods
- Territorial marketing
- Accessibility improvement, socio-cultural-sport-housing support infrastructure
- Policies for regional and local development, based on positive discrimination
- Promotion of job opportunities in the information society domain

- Replacement of forest types: cork oak and green oak instead of pine tree
- Careful choice of cereal type
- Stop using soils near waterlines for agricultural purposes
- Reduce soil mobilisation depth
- Direct seeding
- Ploughing equipment better adjusted to the soil characteristics
- Cultures requiring less soil mobilisation
- Decrease the amount of help (subsidies) – favour practices more adequate

Main Barriers

to whom we express our deep gratitude. Some of the drawings were accompanied by a written description on the meaning and significance of this drawn perception.

The results are, understandably, difficult to quantify but present and represent an amazing and powerful means of conveying the perception and actually showing it. In terms of interpreting these drawings, and the differences between both schools, several issues and cautions should be taken into account. According to environmental psychology (1), there are several aspects to consider and bear in mind in terms of environmental perception:

1. The environment is experienced as an unitary field;
2. People are an integral part of the environment rather than objects within it;
3. All physical environments are inescapably linked to social systems;
4. The influence of the environment on individuals varies with the behaviour in question;
5. The environment often operates below the level of awareness;
6. There may be significant differences between "real" and "observed" environments;
7. Environments can be cognized as a set of mental images.

But as far as perception is concerned, the process of environmental cognition involves several variables and factors (2), which interact to build cognitive representations.

1. Personality variables
 - Personality *per se*
 - Motivation
 - Emotion
2. Cognitive processes
 - Sensations
 - Perceptions
 - Learning
3. Group and cultural factors

Starting with the drawings from the Lisbon metropolitan area school, it soon became self-evident that classifying and quantifying the drawings and representations was, simultaneously, very difficult and subjective. Nonetheless, several major themes appeared:

1. Deforestation;
2. Forest fires (Fig.15);
3. Pollution;
4. Soil erosion – land degradation (Fig. 16);
5. Agriculture practices (Fig.17).

(1) WALMSLEY, LEWIS, 1992, pp. 22

(2) op. cit., pp. 10

Most of the drawings were very elaborate and complex, some were very expressive, but the major differences had to do with different backgrounds and socio-economic groups the children belong to, as this school is located in an area that has both very low income, socially problematic children, together with children from high income families. This factor undoubtedly affects the drawing and communication skills, as well as perception itself.



Fig 15 – Fire



Fig. 16 – Land degradation

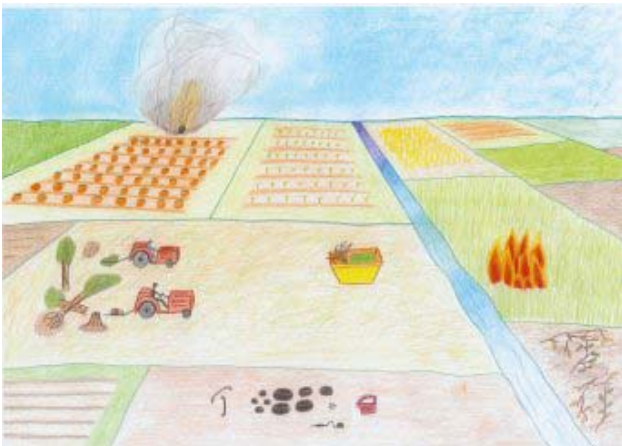
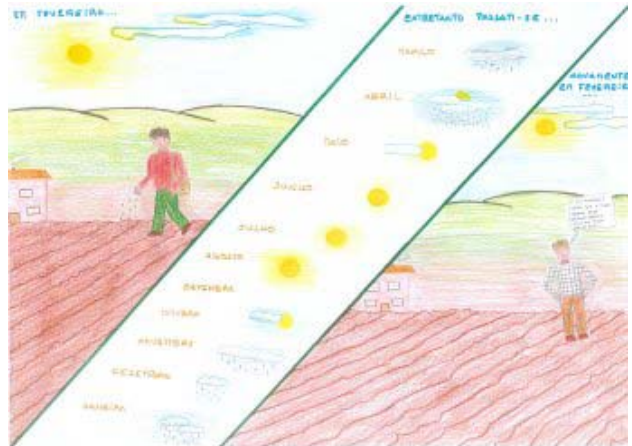


Fig 17 – Two aspects of rural landscape and farming labor.



The drawings from the Mértola School are extremely interesting, the main issues are depopulation and land abandonment, but there is a striking set of drawings with roads leading to major cities, thus referring to a further rural exodus and search for more developed areas, as urban culture is becoming largely dominant as conveyed by the media. The main themes drawn can be summarised into four great groups:

1. Deforestation (Fig.18);
2. Depopulation (Fig.19);
3. Land abandonment (Fig.20);
4. Roads out to the big cities (fig.21)

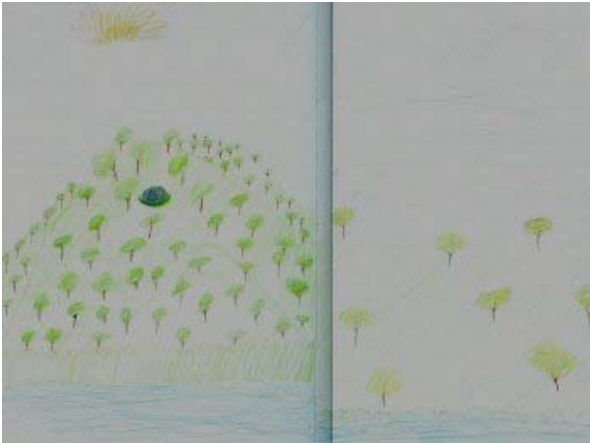


Fig. 18 – Deforestation

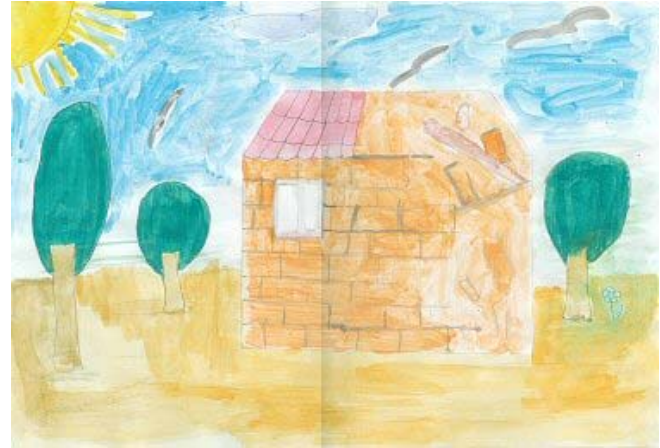


Fig.19 - Depopulation



Fig. 20 – Land abandonment

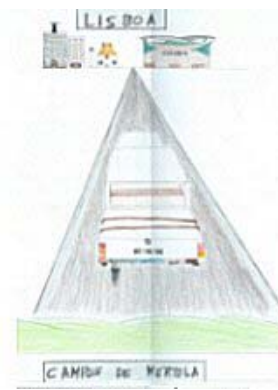


Fig.21 – Roads out to the big cities

The drawings made by youngsters from two very distinct areas (Lisboa e Mértola) clearly show the different perception elements about the different phenomena associated with desertification. The analysis of these results was crucial for the elaboration of a strategic information and mitigation plan. By looking at these images and extracting the right perception elements it was possible to better organize in these two schools comprehensive information and dissemination sessions about desertification.

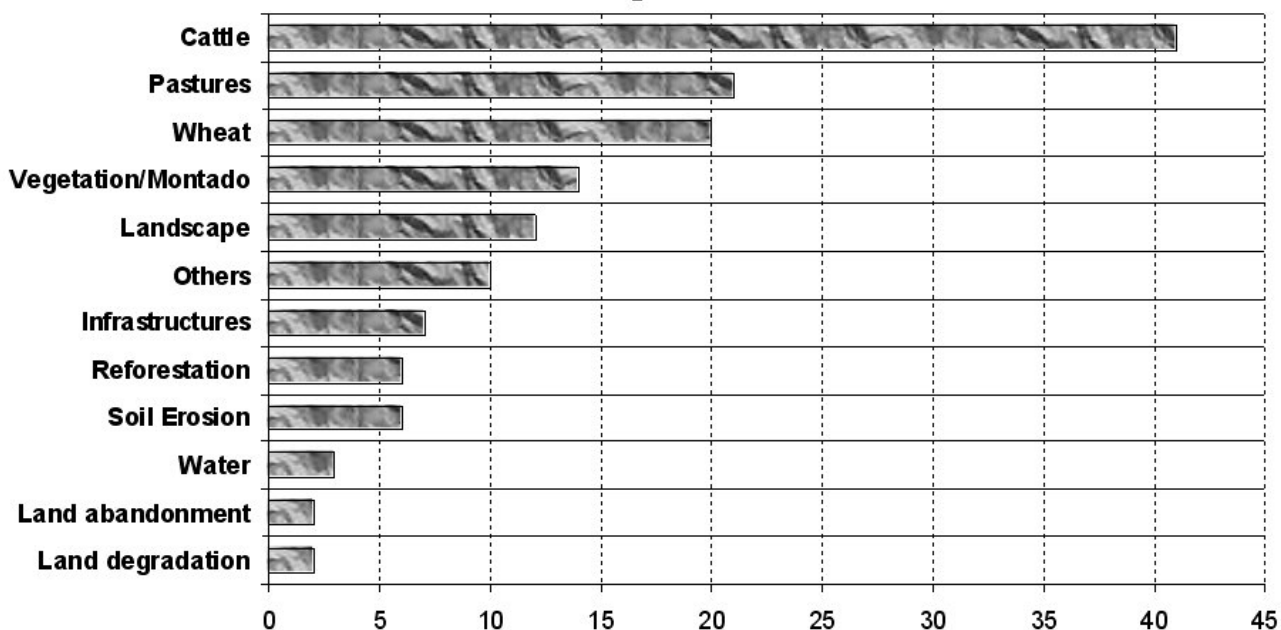
- **Farmer Participation in Land Degradation Perception**

Another interesting approach arose from the drawings as a means to actually “see” the perception; the question was how the farmers perceived Desertification, land degradation and ecosystem conservation in their own environment. The approach had to be different, as drawings were more or less out of the question, so the means have to involve the farmer’s own analysis and knowledge of these phenomena.

The choice was on the use of disposable cameras. Ten farmers were asked to take pictures of positive and negative aspects of agricultural activity. After they returned the cameras and processing was performed, a personal interview followed, in order to understand and know the reasons and relevant issues in each picture, followed by a systematization of the qualitative data collected.

The subjectivity of the answers and the conditions surrounding this exercise have to be taken into account, as well as the environmental cognition issues mentioned before. Nonetheless, this is an extremely interesting way of seeing through the farmer's eyes, avoiding the pre defined methodologies of workshops and surveys, which often inhibit participation and responsiveness.

The analysis of 144 photos taken by farmers during one month, April – May 2003, had the following results:



There is a very clear image in the issues and aspects that worry farmers, and that they perceive as relevant or related with economic issues (cattle)

An example of the database built, indexed on the pictures and with further data collected during the interview with the "photographers" follows:



Foto ID: 22
Indexed as:
 "Unsustainable Montado management"
 "Bad practice"

Date: April, 2003
Location: Mértola Hill
Name: -
Age: -

Description: People that cleaned these trees should be in jail... It is a pity that people who knew how to care of trees are disappearing... It is a loss of knowledge, bad for nature".

Cattle



Mr. António Dias



Mr. José Neta

Wheat



Mrs. Dulce



Mr. José Jacob

Land Degradation



Mr. José Jacob



Mr. António Dias

Soil Erosion



Mr. José Jacob



Mr. Manuel Dias

Socio-economic relevance and policy implication of this kind approach;

- Concrete fundamental linkage between science and society;
- Participative model for interaction with the stakeholders;
- Involvement of the local populations in the discussion and wakefulness to desertification phenomena;
- Evaluation of the policies impact in a local framework, on each target area;
- Indicators will allow a better assessment of desertification, more accurate diagnosis, contributing to improve EU policies.

2.2 - SPAIN – Guadalentín Bassin - Workshop, 21 June 2002

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2.2.1 - Questionnaire on the perception of desertification

The objectives of the perception of desertification enquiry in the Guadalentín were to

- Obtain information about the perception of environmental conditions generally, and desertification in particular.
- To see if there were differences in the perception of desertification in urban and rural areas
- To see if there were differences in the perception of desertification by those involved in dry and irrigated farming.

Representative farmers in the 15 geographical regions of the Guadalentín basin were contacted through agricultural cooperatives. Farmers with specific interest in organic farming, reforestation and hunting were contacted through the public administration. Almost 90 questionnaires were returned.

The most noticeable differences in perception were related to those involved in dry and irrigated farming. People were not really familiar with desertification but those in irrigated farming identified it with drought and those in dry farming with deforestation. The consequences of desertification were thought to be the end of agricultural activity, the approach of the desert and emigration (particularly believed by those in irrigated

farming). Neither group considered it yet to be a serious problem. It was thought that national government has to take measures to prevent the end of agricultural activity by bringing water and controlling farmers' activity (particularly believed by those in dry farming). Farmers in irrigation were reluctant to accept measures such as control of crop types or cultivated area while those in dry farming agreed these were necessary.

2.2.2 - Workshop in the identification of desertification issues and indicators (21 June 2002)

University teachers and researchers, farmers, local administrators from the city councils, regional administrators from the departments of environment, agriculture and rural development, representatives from farm cooperatives and unions and environmental education associations attended the "Perceptions on Desertification" workshop. At the beginning of the workshop participants were invited to give their opinion about desertification and its effects in the Guadalentín basin. They were then asked what indicators would be useful for the assessment of desertification.

Using the contributions of the workshop participants, the following perceptions about the **origins of desertification** were identified (not listed in order of importance).

- Soil is not properly valued as a resource
- Sloping soils are ploughed
- The prevalence of the very intensive model of agriculture
- CAP does not work properly in the area; the idea of multi-functional agriculture does not work for the Guadalentín
- Not enough is done by the administration to develop soil protection measures
- There is a culture of new agriculture based on irrigation and easy money
- Technicians and managers do not have enough knowledge about desertification
- The combination of dry and irrigated farming is leading to fragment of the territory
- Overgrazing
- New cultivation on sloping or forest soils
- An intensification in dry farming
- Not enough emphasis on quality in dry farming productions
- "Mental" desertification.

Again using the contributions of the participants the following perceptions about the **signs and consequences** of desertification were identified (not listed in order of importance)

- Loss in crop production
- Loss in water quality
- New irrigation cultivation on dry farming areas
- Disappearance of springs
- Depopulation and population movement in rural areas

- Degradation of abandoned agricultural land.

In response to the specific question "**What indicators would be useful for desertification assessment?**" the following indicators were suggested;

Main indicators

- Information about intensification of agriculture: expenditures on energy and water, use of fertilizers, plastics...
- Diversification of land use
- Demand for jobs (since more a stable agricultural system has a higher demands for jobs)
- Density of the rural population in drylands (as an indicator of depopulation in rural areas)
- Disappearance of water springs (as a measurement of the overexploitation of the water tables)
- Cultivated area under subsidies
- Lack of traditional knowledge about collecting and exploiting water and prevention of floods
- Area of sloping soil cultivated
- The cost of not doing anything
- Quantity and density of species in one area and the relationship between well preserved areas and degraded areas.
- Ecosystems resilience (studies on germination in well preserved and degraded soils)

Other indicators

- Lack of natural vegetation
- Average farm size
- Annual rainfall and its distribution
- Mechanization index
- Non-cultivated agricultural land
- Bush like dryland area "matorral area" (how much area without trees but bushes is in one area, as a measure of the "reserve" of soil)
- "Sealed" agricultural soil because of infrastructures and urban growth
- Use of marginal soil
- Local stakeholders changes because of globalisation
- Lack of technicians with a depth of knowledge about desertification

The **main conclusions** of the workshop were:

Soil as a resource is running out in the area. Even though it is identified as a very severe problem, it is not considered a priority at the political level. Two agricultural models exists in the Guadalentín basin and they are related to two different kinds of sensitivity to the environment:

- Intensive farming, which is a resources consumer and has a very aggressive effect on the environment and
- Dry farming, which is becoming more and more marginal.

It is necessary to work towards sustainable agriculture, which includes the quality of life for the farmers, taking into account the big differences between the two kinds of agriculture.

Human activities and technologies that have enabled intensification of farming are considered responsible for desertification. However, human activity in taking land management measures towards sustainable agriculture is considered the only way to combat desertification.

There is not enough coordination nor accurate information on land management measures to combat desertification. In some cases the Common Agricultural Policy (CAP) is more a problem than a solution. It is necessary to control and regulate agriculture in a different way, directing it towards a quality production.

2.3 – ITALY – Basilicata - Agri Valley

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2.3.1 – Questionnaire on Public Perception of Desertification

The survey took place both in the target area (Agri Valley) and in the rest of the Basilicata region, considered less or even not affected by desertification processes, summing up to 1,707 questionnaires.

The reason to extend the inquire out of the Agri has been to verify whether the community who lives directly the phenomena has a different perception of land degradation respect to other people apparently less directly involved in the process.

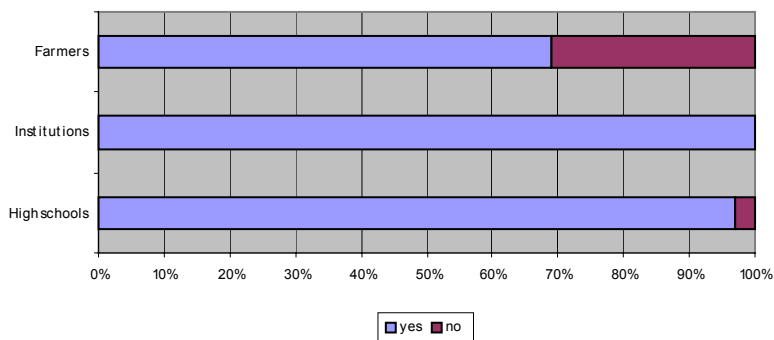
In the Agri Valley, representatives of the local community constituted the sample to which we submitted the questionnaire. The sample survey was focused on three categories: young generation, farmer and local administrator, with the objective to gather different attitudes and sensibilities from the perception of who now is involved end/or could be implicate in the future in the management of the land.

The survey, then, was extended at population living in the rest of the Basilicata region. For this area the analysis was focused only on the young generation and administrators that were the target of an essential action of sensitisation.

Concerning the Agri Valley, the local high schools have been privileged; interviewing teachers and students, to get an immediate answer of desertification perception of the young generation, and, at same time, promoting an important action of sensitisation towards the theme. In the high schools 406 questionnaires have been gathered, 25 questionnaires were submitted to local administrator and Basin Authority representatives and 90 to the local farmers.

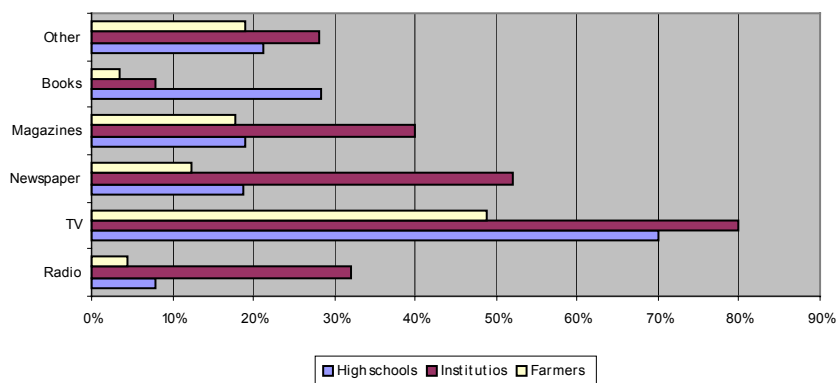
Following we report some elaborated results. The figure 1 shows as the perception of the phenomenon differs according to the sample population interviewed: while all local administrators and the 97% of the students interviewed affirm to know what the desertification is, the percentage of the farmers is notably lower and equal to 69%.

Figure 1- Agri Valley
Do you know what desertification is?



Regarding to the information sources, it is clear the predominance of the television as privileged information tool. The Television gets the most greater number of preferences for all the interviewed categories, whereas for the three samples the express order of preference changes for the remaining sources: the books, that occupy the second position for the students, are revealed the sources less consulted for both administrators and farmers, that instead prefer magazines and newspapers.

Figure 2- Agri Valley
How did you come to know about it?

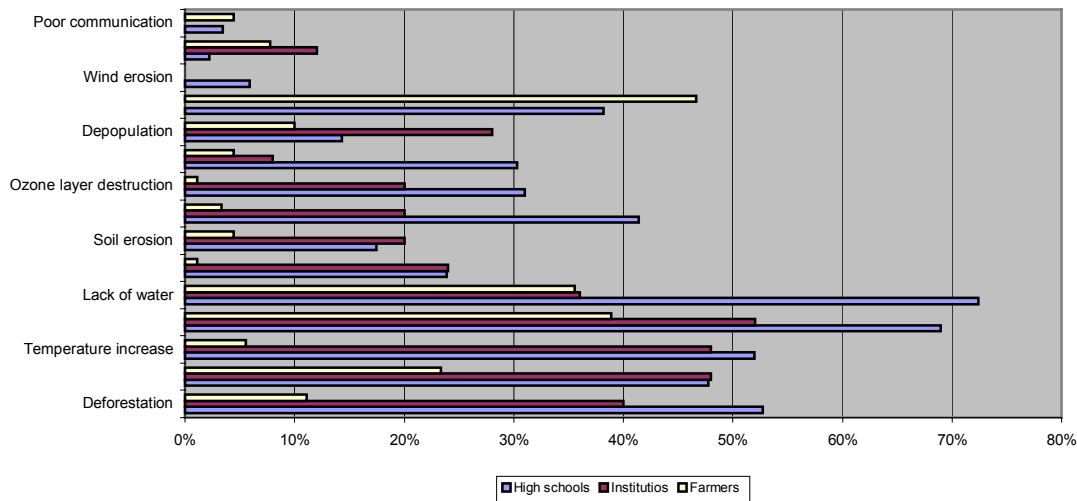


Respect to the desertification issues, the situation is rather different among the three categories. Although there are the factors indicated as important for all the categories interviewed, like Lack of water, Climate change, Deforestation and Droughts and, similarly, there are factors that have little importance for everybody, like Poor communication, Wind erosion and Lack of employment, nevertheless the issue order is notably different among the three categories. Some very important factors for one sample results entirely absent in the perception of the others ones. Desert advance is, for instance, the factor most related to the

desertification for the farmers, instead this problem has not been suitable for any local administrators, and it results to the last position in the student's answers.

Lack of water is the problem most indicated by the students, while it has resulted, respectively, at the third position for the farmers and as fourth for the representatives of the institutions, in fact they pointed out Droughts as the most important factor.

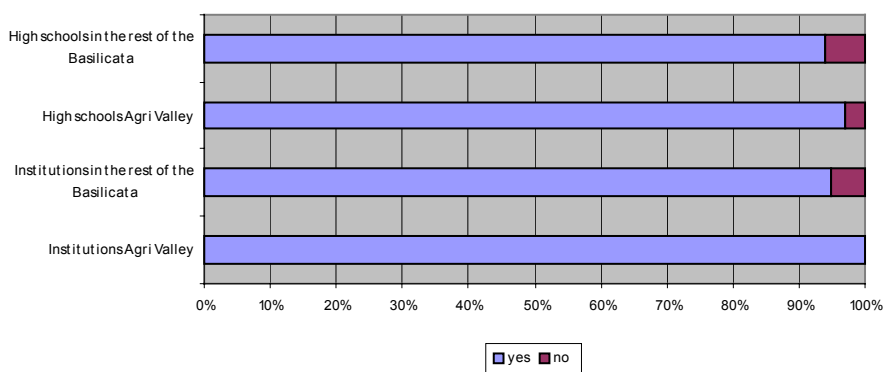
Figure 3- Agri Valley
What do you relate Desertification with?



After the Agri inquire, the survey was extended to the rest of Basilicata region, considered less or even not affected by desertification. In this area have been submitted 1,087 questionnaires to the students and 99 questionnaires to local and regional administrators. Following we report some elaborated results that compare the answers of two different target sample survey (young generation and administrators), both in the Agri Valley and in the areas out of Agri Valley (indicate with as rest of Basilicata).

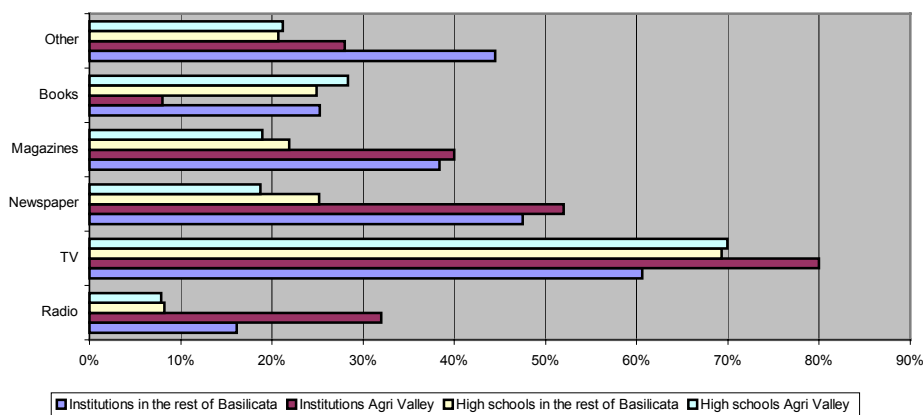
A very high percentage, that in some cases reaches 100%, of the interviewed, declare to know the desertification, the percentage is greater in the Agri Valley compared to the rest of the Region, and it's higher for the representatives of the institutions, respect to the students.

Figure 4 - Do you know what desertification is?



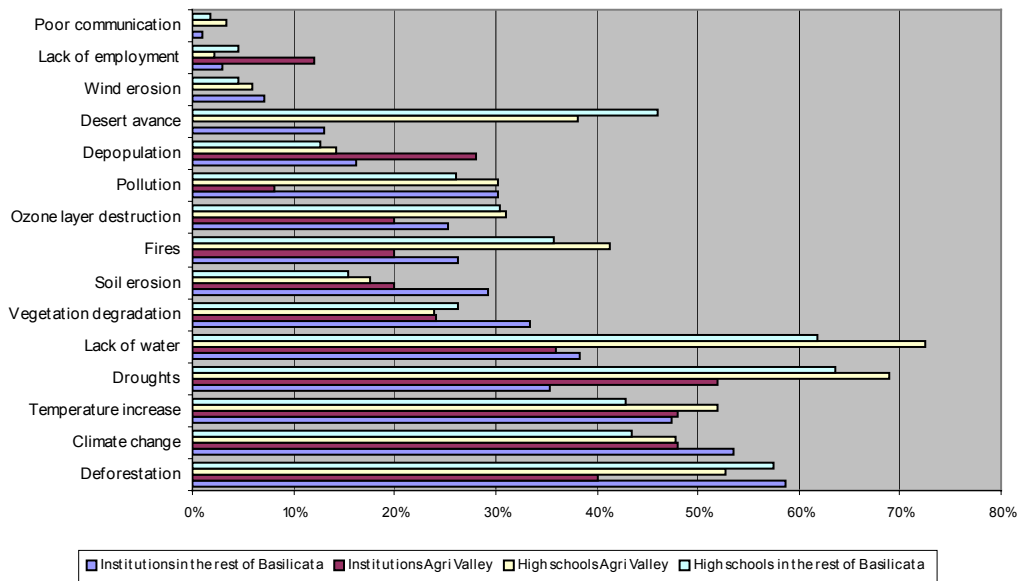
Among the areas and the samples interviewed the television is confirmed the way of knowledge used the most, while approximately the preferences of the students don't introduce strong divergences in the two areas as those of the representatives of the institutions.

Figure 5- How did you know about Desertification?



About the knowledge of desertification, the answers of the two samples look like for many factors, whether they live inside or outside to the area affected by desertification. The results show, nevertheless, a greater convergence in the answers of the students, much less for the other categories. The factor Pollution, for instance, has been suitable from the 30% of the representatives of the institutions in the rest of the Basilicata region and only from 8% of those of the Agri Valley; the factor Droughts has introduced a big difference from 35% to 52%, passing from the preferences of the representatives of the institutions in the rest of the Basilicata, to those of the Agri. Lack of employment it's a problem more felt by the Agri Valley administrations (12% of the preferences), in comparison to the external ones (3%) and to the students, both inside the Agri Valley (2%), that external (5%). At the same way, Desert advance that has not received any indication from the sample population of the Agri Valley institutions has been chosen from the 13% of the institutions in the rest of the Basilicata region.

Figure 6- What do you relate Desertification with?



The National Plan to Combat Desertification is, instead, well known from the rest of the Basilicata community, respect to the Agri Valley. As predictable, its existence is less known among the students that by the administrator. Nevertheless, the percentages of them declaring to ignore the Plan, is still too high, both inside (64%) and outside the Agri Valley (52%).

The knowledge of the Plan, anyway, is very superficial, in fact only the 18% of the representatives of the institutions, and less of the 2% of the external students known some actions included in the Plan and, above all, any representative of the Agri Valley institutions declares to know them. Very low appear also the percentages of the interviewer knowing the Minister who is responsible of the Plan implementation.

Figure 7-Do you know a National Plan to Combat Desertification exists?

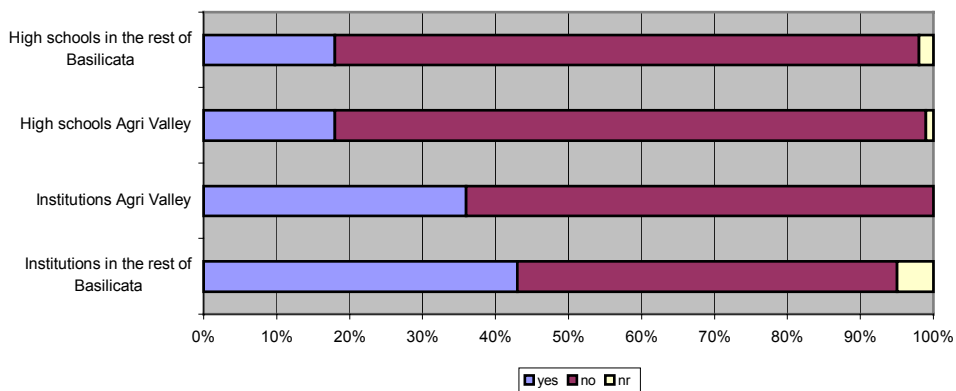


Figure 8 - Do you know some actions of the National Plan to Combat Desertification?

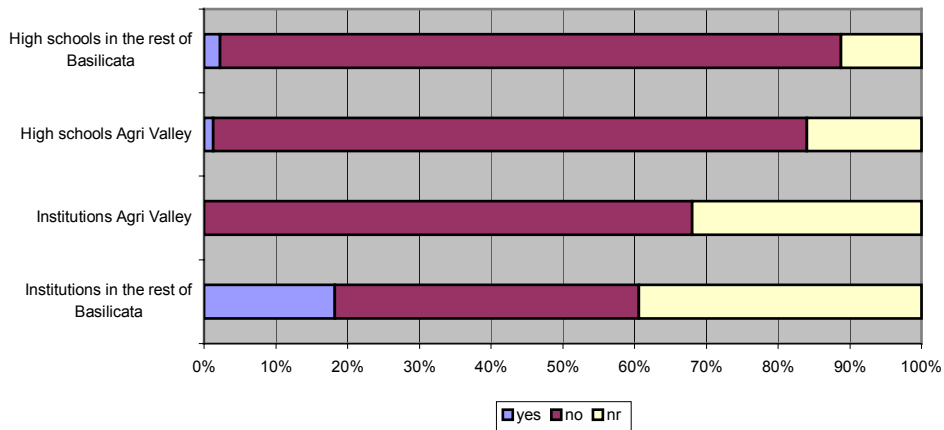
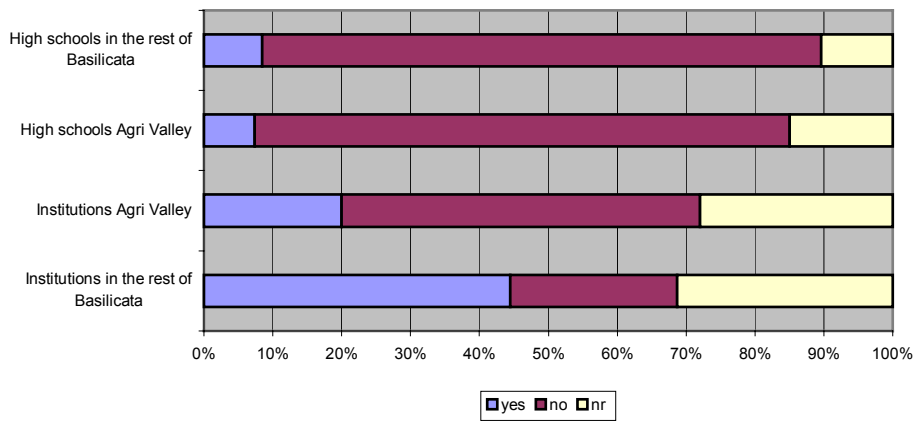
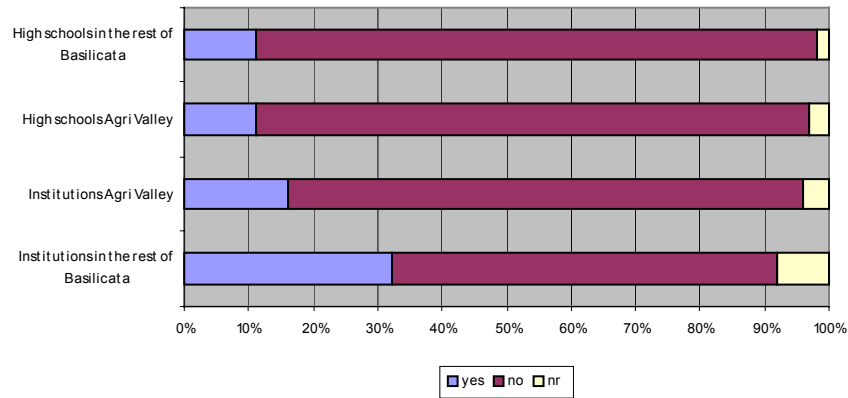


Figure 9- Do you know which Ministry is responsible for its application?



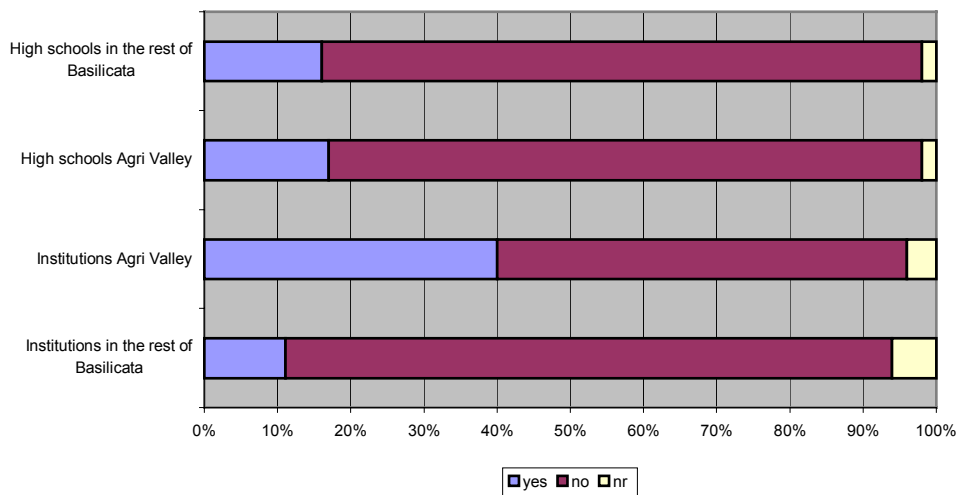
Very low seems also the percentages of the people declaring to know the existence of the "World Day to Combat Desertification", that like a moment of sensitization, it should have a great impact in the collectivity. Since the declared source of information (TV), this means in turn, a lack of attention of the mass media whit respect to the matter.

Figure 10 - Do you know the "World Day to Combat Desertification?"



The results of survey conducted in Basilicata region; show that the knowledge of the problem is still insufficient and unqualified, both in the target area and in the rest of the Region. Since the perception of desertification is quite the same in the two areas whit regard to the young generation, it seems that the institutional representatives of the areas not affected have a better awareness than Agri Valley ones. This give evidence of a serious situation, even worse for the reason that about 40% of the Agri Valley administrations run also an own farm, so they are involved in land management both like institutional capacity and like farmer. The reason of an uncorrected knowledge, in part, is imputed to the lack of official information sources that reveal qualified knowledge concerning desertification, while at the moment the information channel more used from all the sample population is the public Television network.

Figure 11 - Daes your family own a farm?



2.3.2 - Workshop in the identification of desertification issues and indicators (22 to 23 April 2002)

The workshop was held in the Agri Basin from 22 to 23 April 2002 and involved 166 participants (main stakeholder group plus high school students). The discussion was related to the signs of desertification and solutions that could be adopted to combat or mitigate it.

The **conclusions** were that desertification was caused by:

1. Impoverishment and degradation of territorial resources

- Reduction of available water resources
- Bad maintenance of pipelines
- Decrease of land productivity
- Less tourist attraction (opportunity or dangerous)
- Increase of deforestation and fire risk
- Abandonment of traditional technologies and tacit knowledge

2. Climate change

3. Increase of territorial disparity (coastal/internal)

- Reduction of rural population
- Ageing rural population
- Abandonment of agricultural land
- Ecosystem alteration due to the innovative agricultural technologies
- Demographic pressure
- Increase of social conflict for the use of natural resources, especially water

4. Absence of the perception of the economic value of natural resources

- Degradation and low quality of life
- Increase of the cost for services (especially transport) due to territorial degradation
- No integration of environmental variables in the territorial and sector policies and/or missing of integrated approach from the policy makers
- Development policies (for the agricultural sector) not responding to the local peculiarities
- Absence of controls on the results of public funds

5. Absence of a territorial network able to manage a phenomena that is the cause and effect of weakness of social capital.

2.4 - GREECE – Lesvos Island

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2.4.1 – Questionnaire on Public Perception of Desertification

The results of the general questionnaire (Fig.1) show that people in the island of Lesvos have realized the meaning of desertification and the impacts of this process. The impacts of desertification on land function are mainly associated with the lack of water and drought (Fig.1). Climatic changes in the area are related to the decrease in rainfall as well as temperature increase. These climate changes, in connection with the development of tourism, are associated with forest fires, deforestation and the destruction of natural vegetation (Fig.1) aggravating the problems of desertification in the island.

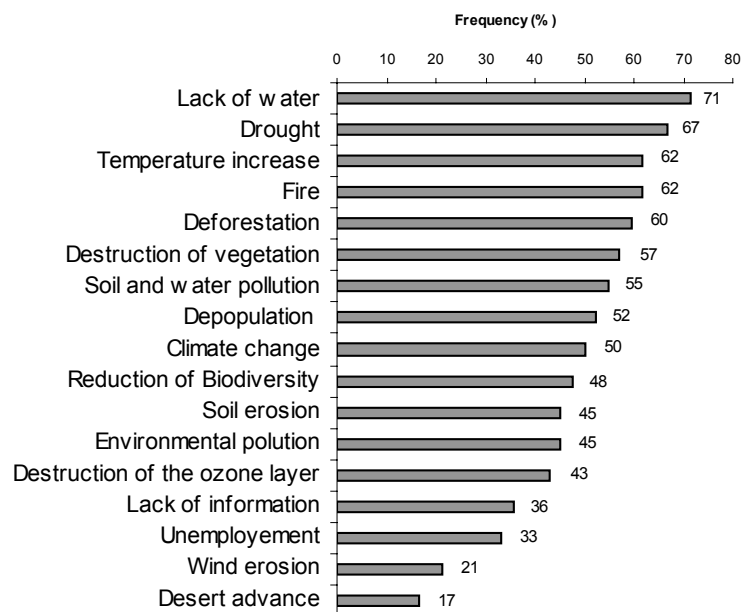


Fig. 1. Frequency distribution of the various impacts of desertification

- The impact indicator "soil and water pollution" is mainly associated with the application of fertilizers and pesticides. The local population considered desertification a serious problem generally related to the environment. Soil and water pollution are also connected with the enrichment of the soil with radio nuclides transported in the atmosphere from accidents. This process of soil pollution is associated with desertification and the environment for the people. Also the term environmental pollution is generally connected with soil and water pollution but also with pollution of the atmosphere with polluted gases from industry, automobiles, forest fires etc.
- Depopulation is defined as the migration of the local population to urban areas. Depopulation is considered a consequence of land degradation, reduction in land productivity, and loss in farm income.
- Half of the people questioned (50%) considered climate change as an important factor (Fig.1). The destruction of the ozone layer was also considered important although with a lower score (43%). The questionnaire shows that climate change and desertification are mainly associated with increase in air temperature and the lack of rainfall.
- The meaning of the term biodiversity was not well understood and therefore most people didn't consider it as an important consequence of desertification on the island.

- Water and wind erosion were identified as the main processes of land degradation and desertification in the hilly areas of the island. Soil erosion caused by runoff water and wind was considered an important factor by 45% and 21% of the people, respectively.
- Lack of information, unemployment, and desert advance received the lowest scores (Fig.1).

Overall the analysis of the results of the above questionnaire led to the following conclusions: (a) people in the island of Lesvos are relatively well informed of the consequences of desertification, (b) there is a lack of information on soil erosion and its consequences on land degradation and desertification, (c) desertification is mainly connected to the lack of water.

2.4.2 – Workshop on “Land desertification, causes and impacts: the example of Lesvos Island Greece” 17 to 18 June 2002

A focus group workshop was organized in Lesvos, 17-18 June, in which participants were asked to provide their opinion and stance with respect to the principal list of questions presented in the farm survey and (a) to identify the major impacts of desertification and (b) to define candidate impact indicators. For those purposes, the Agricultural University of Athens in collaboration with: (a) the Aegean University (Department of Geography), (b) the Municipality of Eresos-Antissa, and (c) the Natural History Museum of Lesvos Petrified Forest, organized a workshop in Sigri, Lesvos on June 17-18th. This workshop included the objectives of workshop 1 (WP1.2) and workshop 3 (WP 1.3). It was organized in collaboration with the local authorities in order to become more attractive by the local stakeholders. The duration of the workshop was 1.5 days. It was attended by 38 land managers as well as other related policy groups drawn from the local population, local public and private organizations.

Great effort was made to attract people in the workshop by: (a) sending personal invitations to all people involved in administration, institutes, and local municipalities, and (b) advertising the workshop for more than one week on local television, radio, newspapers and megaphones in the villages. However, it must be noted that the farmers were not formally represented, due to their lack of expectation that anything practical would result from such meetings. The input of the farmers is very important for developing further actions in E.U. and at national level in the context of desertification and therefore their absence from the workshop was a real gap for better issue.

It clearly appears from the workshop discussion that the general public recognizes the impact of land degradation and desertification on land function. Low grass production in pasture areas was greatly stressed during the workshop discussion. The low productivity of the land in grass has resulted in transportation of huge amounts of animal feed from the mainland. The capability of the land to produce grass is so low that animals can graze the land for 4-5 months per year or less, depending on the amount and rainfall distribution.

Another important impact of desertification in Lesvos is the frequent flooding of the lowland areas. The capacity of the land to store rainfall water is very low due to the shallow soils in the western part of the island and also very low water permeability of the parent material resulting in high amounts of runoff water.

An important point raised by the local people and institutions was the lack of knowledge of the existence as well as the content of the action plan of the "National Committee to Combat Desertification". Many proposals made by the committee could lead to an income reduction, in which case the people affected should be compensated. In order to be effective any measures presuppose the acceptance by the majority of the population, as they will be called upon to implement them or might even be affected by their implementation. Although the national plan does not offer a clear prescription to combat desertification that may apply to any given case it has set the framework with a number of proposals. However, it is the task of the local people, their institutions and the local administration to develop their own plan to solve the problem, based on area specifications within the frame set by the national plan and drawing on the proposals made in it. The workshop itself was a call for action and a proposal was set forward in that matter.

The practice of burning scrubs to favour herbaceous vegetation was yet another issue set forward at the workshop. The discussion focused on the law introduced in 1979. After the law enforcement the situation deteriorated as the forest service seized to sue the shepherds that follow the above practice. It was pointed out that currently the shepherds have no alternative but to set the scrub on fire in order to survive. Therefore, on the question of turning the area into a forest the answer was clearly negative.

The issue of large-scale versus smaller projects was also discussed. The administration was criticized for planning large-scale projects that yield minor results. It was proposed that small-scale projects aimed at erosion control or water storing at the farm level might be more effective in the future.

The questionnaire of candidate indicators, distributed at the workshop, included all possible indicators that can be used for defining ESAs (Fig.2). From that list of indicators, the impact indicators received lower scores than others (state, pressure and forces, response indicators).

The rate of agricultural land abandonment was considered as the most important impact indicator of the desertification of Lesvos. This was mainly attributed to the morphological characteristics of the agricultural soils in the area. Soils underlying pastures were very shallow with slopes greater than 18% while the productivity of these soils was limited to very low grass production used for pasture. Soils underlying olive trees found in sloping areas, were deeper than in pastures while the terraces protect them from erosion. In several cases the land was abandoned due to the high cost of maintenance of the terraces, the low price of olive oil, and the sensitivity of the soils to erosion.

Frequency of floods is another important impact indicator affected by the high degradation of soils. Floods are very frequent in the lowland causing serious problems in crops and for the people living in these areas.

The farm income as well as the rate of loss in farm income is another issue closely related to the high degree of land degradation and desertification. People cannot survive under such conditions and therefore migrate to other areas with better living conditions. Therefore, as seen in Fig. 2, the impact indicators: (a) loss in farm income, (b) farm income, and (c) migration, were considered as the most important by the focus group.

More than half of the participants in the workshop pointed out another important group of impact indicators including the following: (a) loss in forest production, (b) loss in land production, (c) land productivity, and (d) forest productivity.

Finally the following indicators: (a) rate of change in acidified soils, (b) rate of change in salt affected soils, (c) rate of change in water storage in dams, (d) produced/imported animal feed, and (e) rate of dam sedimentation, were considered as less important for the island of Lesbos. Acidified soils are widely extended especially in areas where soils have been formed from acid igneous rocks. Acidity problems are not so noticeable because these soils are not severely acid (pH usually greater than 4.5) and are used mainly for pastures. Salt affected soils cover about 0.2% of the total area of the island. They are located in the lowland areas along the seashore in the alluvial plains of Kaloni, Geras, Eresos, Sigri, Petra, and Vatera. Water reservoirs are limited in the island. There are only two small reservoirs (Mythimna and Kaloni). A new dam has been built recently in Eresos, which is expected to face severe future problems of sedimentation and decreasing water storage capacity due to high erosion rates in the area. The animal feed produced on the island is limited and therefore a great amount is transported from the mainland in order to cover the animal needs. Although local people don't consider this an important impact indicator of desertification because the idea is that even though the land produces high amount of grass, other food such as corn, cotton pie, alfa alfa etc., (which is not produced in the island) must be supplied to the animals for better growing.

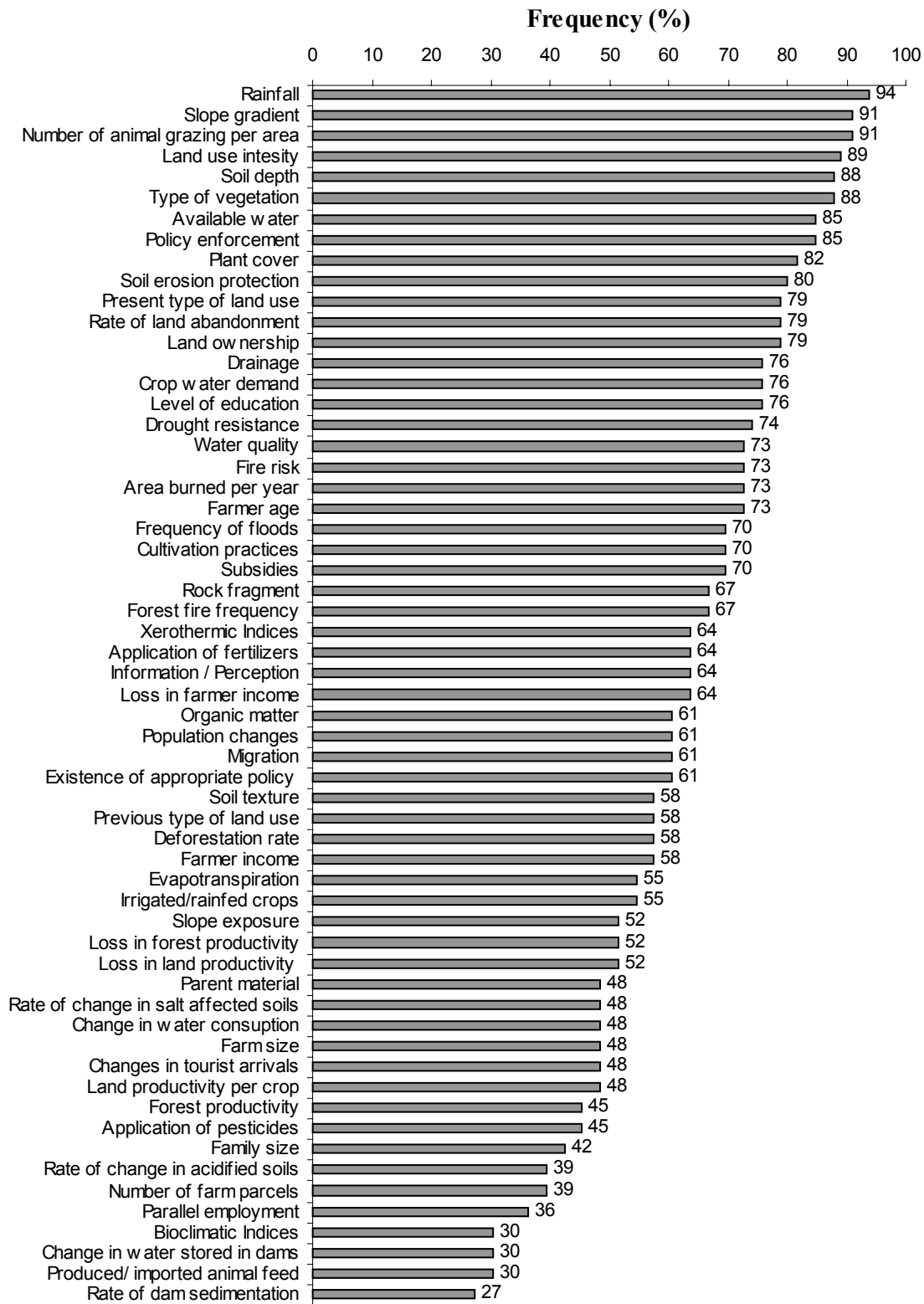


Fig. 2. Preference frequency of accepted indicators as defined by the workshop participants.

Discussion and conclusion

The methodology chosen, both for the enquiries and workshops, has proved to allow a good comparison between the target areas, as well as to analyze the extent to which stakeholders participate and their degree of involvement, as well as provide the means to obtain indicators to monitor desertification.

Through these two approaches, it was possible to know the differences in perception that the stakeholders of the different target areas had, due to the complexity that the phenomenon of desertification presents, as well as evaluate and the factors that were connected with this phenomenon. The principal results are presented in the following table;

Target Areas	Main results from the questionnaires
Portugal - Mértola	<p>People, associate Desertification with depopulation, unemployment, poor accessibility, deforestation, advance of deserts and lack of water</p> <p>Lack of knowledge about the National Plan to Combat Desertification.</p>
Spain - Guadalentín	<p>People were not really familiar with desertification</p> <p>In irrigated farming identified it with drought</p> <p>In dry farming with deforestation.</p> <p>The consequences of desertification were thought to be the;</p> <ul style="list-style-type: none"> - End of agricultural activity, - The approach of the desert, - Emigration (particularly believed by those in irrigated farming). <p>Neither group considered it yet to be a serious problem.</p>
Italy - Agri	<p>The knowledge of the problem still insufficient and unqualified, both in the target area and in the rest of the Region.</p> <p>The knowledge of the Plan is very superficial.</p>
Greece - Lesvos	<p>People in the island of Lesvos are relatively well informed of the consequences of desertification.</p> <p>There is a lack of information on soil erosion and its consequences on land degradation and desertification.</p> <p>Desertification is mainly connected to the lack of water.</p>

We believe, that perception studies are fundamental to analysing complex phenomena, like desertification, sometimes not too clearly perceivable or without a strong economical component, and because people don't have a correct "image" of what desertification is, the implementation of mitigation actions can be difficult and jeopardized.

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