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## Conducting Qualitative Research on Desertification in Western Lesvos, Greece

Theodoros Iosifides

*University of the Aegean, [iwsifidis@aegean.gr](mailto:iwsifidis@aegean.gr)*

Theodoros Politidis

*University of the Aegean, [tpolit@aegean.gr](mailto:tpolit@aegean.gr)*

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## Conducting Qualitative Research on Desertification in Western Lesvos, Greece

### Abstract

The main aim of this article is to present some critical methodological strategies employed in a qualitative research study on local socioeconomic development and desertification in western Lesvos, Greece. Through in-depth qualitative interviews with local producers in western Lesvos, Greece, an effort was made to identify and analyze the links between the local socioeconomic trajectory and environmental marginality. The article concerns the justification of the choice of qualitative investigation on the matter, the main methodological strategies employed in the field, and the basic data analysis processes. In particular, we discuss the gradual development of a coding framework and a conceptual model for understanding and explaining the interrelations between local socioeconomic development, and characteristics and problems of land degradation and desertification.

### Keywords

Desertification, Local Development, Socioeconomic Factors, In-depth Interviews, and Qualitative Data Analysis

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# **Conducting Qualitative Research on Desertification in Western Lesvos, Greece**

**Theodoros Iosifides and Theodoros Politidis**

University of the Aegean, Lesvos, Greece

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## **Introduction**

Land degradation and desertification are complex problems that are produced and reproduced through interaction between biophysical and human – social factors. According to the United Nations Convention to Combat Desertification (GCAD, 2000; GNCCD, 2000; UNCCD, 1994):

(a) “desertification” means land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities;

(b) “combating desertification” includes activities which are part of the integrated development of land in arid, semi-arid, and dry sub-arid areas for sustainable development which are aimed at:

(i) prevention and or reduction of land degradation;

(ii) rehabilitation of partly degraded land; and

(iii) reclamation of desertified land

(c) “land degradation” means reduction or loss, in arid, semi-arid, and sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest, and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:

(i) soil erosion caused by wind and/or water

- (ii) deterioration of the physical, chemical, and biological or economic properties of soil; and
- (iii) long-term loss of natural vegetation” (Article 1)

Even by the above relatively technical definition it is clear that the desertification phenomenon is characterized by great complexity and by a very strong interplay between physical-environmental and human factors, which act together, generating the problem. The term “desertification” was introduced by the French ecologist Auberville in 1949 referring to the degraded soils in the Sahel region of Africa (Perez-Trejo, 1994). Perez-Trejo, in a European Commission Report on Desertification and Land Degradation in the European Mediterranean, offers ten different definitions and orientations of the problem from 1976 to 1992. According to the last three definitions desertification is:

- The process of desert advancement in the savannah area as a consequence of the recurrence of rainless years and increasing anthropic pressure on the land resources. The term has now been extended to any kind of soil and/or land degradation process leading to a more or less irreversible state of unsuitability to sustain vegetation growth (Chisc as cited in Perez-Trejo, 1994, p. 9)
- The degradation of ecosystems in semi-arid or arid regions, degeneration usually being measured in loss of primary productivity and/or species diversity (Barrow as cited in Perez-Trejo, 1994, p. 9)
- The degradation of land in arid, semi-arid and dry sub-humid areas resulting mainly from adverse human impact (UNEP as cited in Perez-Trejo, 1994, p. 9)

The same author notes that from the evolution of the definitions of the desertification phenomenon it is evident that the emphasis is given on human activity and socio-economic processes, as the principal causes possibly aggravated by natural climatic conditions. Generally the main symptoms of desertified and degraded land and ecosystems are reduction of yield and crop failure in irrigated or rainfed farmland; general and gradual reduction of cropland and soil productivity; reduction of perennial or woody biomass; reduction of the availability of water; soil erosion; chemical degradation of soil; salinization, codification, and acidification of soils and water, increasing flooding; sedimentation of water bodies; and disruption of social life due to deterioration of life-support systems (Drenge et al. as cited in Perez-Trejo, 1994; GCAD, 2000).

The underlying causes of the phenomenon of desertification are directly related to human activities; human pressures on the environment and resources; social, economic, and productive organization and practice; and unsustainable ways of living generated by unsustainable production and use of natural resources. The overexploitation of land and water resources, excessive irrigation, overgrazing, deforestation, urban development, and the development of mass tourism are only some of the human activities and practices which derive from deeper political and socio-economic causes and processes, which lead to unsustainable forms and types of development. Land degradation and desertification in a broad sense are social problems, mainly because the idea and practice of appropriation and use of land are socially constructed. Thus, considerations about land and soil productivity and capacity, land use, cultivation, and sustainable development are the products of the process of human-nature interaction (Blaikie & Brookfield, 1987).

Causes of desertification and land degradation in the northern Mediterranean region can be found mainly due to human activity, socioeconomic organization, and land use change and practices (Arnalds & Archer, 2000). In Greece we can identify a series of areas that face problems of desertification to a different extent, notably central and south Macedonia, central and eastern Crete, Thessaly, and the islands of eastern Aegean, including the island of Lesbos (GNCCD, 2000). The island of Lesbos, especially its western part, is seriously affected by problems of land degradation and desertification. In relation with the severity of the situation the island can be divided in three zones. The first zone, western Lesbos, is characterized by serious problems of desertification. The second zone, central Lesbos, is in a critical situation, whereas the third zone, eastern Lesbos, is at possible risk of degradation and desertification, in case of climatic change or changes in land use patterns (Iosifides, 2002a; Jenkins & Wilson, 2001). The determination of the character of human – nature interaction in relation to desertification and land degradation in western Lesbos is the broad purpose of our research in the area.

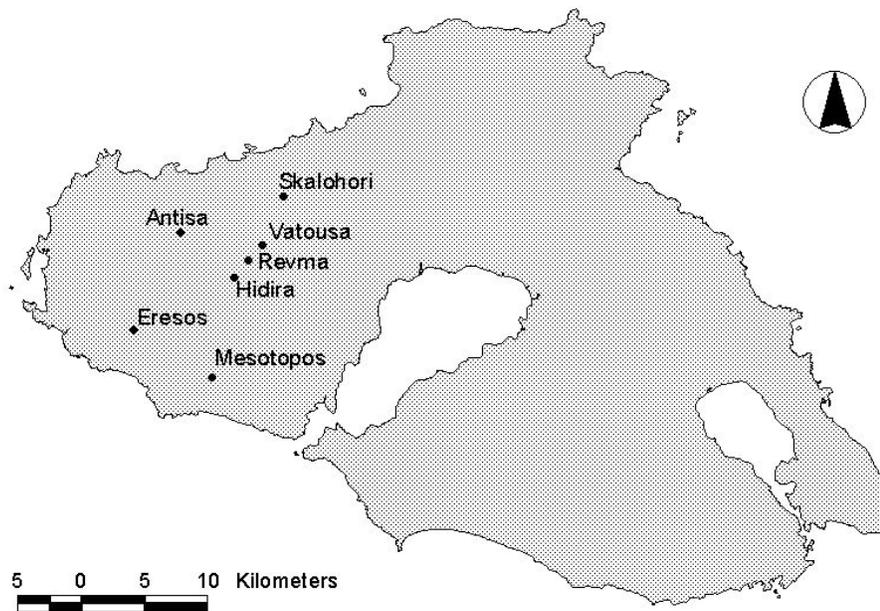
### **Research Design and Methods**

The central question of this inquiry was the exact determination of major socio-economic driving forces towards unsustainable uses of natural resources in western Lesbos, Greece, which produce, reproduce, and exacerbate the problems of land degradation and desertification in the area. More specifically the basic research questions were the following:

1. What are the most widespread production practices in the area of western Lesbos and how are the natural resources (especially land and soil resources) utilized by the local producers?
2. How are these production practices and natural resource uses influenced by the local socio-economic features, its characteristics, and by national and EU rural policies?
3. What are the stances, attitudes, ideas, and actions of local producers in relation to environmental protection and conservation, and how are these stances influenced by their socio-economic situation and prospects?

The research setting was that of western Lesbos, Greece, for a series of reasons. The most important of these reasons was the combination of socio-economic, spatial, and development disadvantages of the area, with environmental sensitivity and severe local land degradation and desertification problems (Blaikie & Brookfield, 1987; GNCCD, 2000). This combination makes western Lesbos a paradigmatic case for investigating the links between socioeconomic development and the desertification process. The methodology adopted in the field was that of in-depth qualitative interviews with local producers (livestock-breeders), as stock breeding is the dominant (and in some communities of western Lesbos the only existent) economic activity in the area (Iosifides, 2002a; Jenkins & Wilson, 2001). In total, seven local communities were selected, Eresos, Antisa, Skalohori, Revma, Vatousa, Hidira, and Mesotopos. The research area and the communities selected are shown in Figure 1.

Figure 1. The Research Setting on Lesvos Island, Greece.



The adoption of a qualitative methodology in this study is based mainly on the specific nature of the research themes derived from the literature, which are briefly stated:

1. We ought to put an emphasis on understanding and explaining the processes and mechanisms of interaction, between socio-economic factors and a local development trajectory, with the production and reproduction of the problems of land degradation and desertification. Although the connections between socio-economic features, local development characteristics, and desertification have been researched in other cases, mainly in developing countries (Kishk, 1993; López, 1997; Mortimore, 1989), research in Greece on these issues are still very limited. Thus, one major purpose of this study was to contribute to an under-researched field of inquiry in Greece. Furthermore, the direction and outcome of the linkages between socio-economic factors and desertification are context specific, and thus focused empirical research at local / regional levels is required for their identification (Perkins & Thomas, 1993). It must be taken into account that quantitative research on this issue in Greece comes mainly from a natural science perspective. This type of research documents the existence and the extent of problems of land degradation and desertification in western Lesvos and other areas of Greece (Cosmas et al., 1996; Yassoglou, 1998), but does not directly connect these problems with broad socio-economic driving forces and factors, and does not take into account the perspectives of local population and producers on this crucial connection. Thus, at this point, the strength of qualitative research on desertification becomes more evident. A qualitative perspective allows the exploration of critical, mainly non-quantifiable aspects

of desertification persistence and reproduction in western Lesvos; thus answering our proposed questions of inquiry.

2. We ought to increase our understanding of social processes in the area and their links with the state of the local environment, through the discourses and narratives of people and producers; in order to take into account local knowledge, responses, and interpretations on how socio-economic problems reinforce negative environmental performance and unsustainable use of local natural resources and vice versa. The need for utilizing the experiences of local producers in western Lesvos, in order to investigate the social and economic mechanisms which lead to unsustainable use of natural resources, and eventually to desertification problems, justifies the adoption of a qualitative methodological framework. We used this framework in a *critical realist* manner, that is, researching the interaction between structural features and causal mechanisms (e.g., socio-economic conditions, characteristics of the local economy, rural development policies) with personal and collective interpretations, attitudes, and stances (e.g., environmental protection priorities, ecological awareness) (Bhaskar, 1986; 1989). The adoption of this theoretical perspective (critical realism) allows the avoidance of both positivist-objectivist explanations, and relativistic approaches and interpretations (Sayer, 2000).

Although we had prior knowledge on these matters we did not develop a detailed or specific research hypotheses, but opted for a *grounded theory* approach in order to allow specific interpretations, stances, and responses of research participants. Explanations and theorizing would then be created from data collected in the field (Glaser, 1992; Glaser & Strauss, 1967).

The basic tool for conducting this research was an *interview schedule* prepared in advance of the actual research process. The interview schedule was a dynamic one, as it was altered in many occasions during field research, reflecting new themes of interest according to the responses of participants. The schedule was divided into five interlinked parts. The first part consisted mainly of general characteristics of stock-breeding production (e.g., type of production; type of land ownership; size of unit; farm labour characteristics; gender and age of interviewees). The second part had to do with rural development and rural development policies (e.g., evaluation of Greek and EU rural policies; production cost determinants; government farm subsidies; final price satisfaction; interpretations and stances on local development and proposals). The third part focused on local socio-economic and spatial conditions (e.g., income problems; poverty; unemployment and underemployment; migration into and outside the area; spatial characteristics; interpretations of life and work in a remote, less favored, area, such as western Lesvos). The fourth part sought survival and social reproduction strategies in the area (e.g., alternative employment and income opportunities; social relations; and solidarity). The fifth part included local stances and responses to the problems of land degradation and desertification in relation to natural resource management and productive practices (e.g., local interpretations and knowledge about the problem of desertification; evaluation of the role of human factors; productive and natural resource practices; environmental priorities; concerns and actions). We tried to keep the interview schedule as flexible as possible; avoiding leading questions and thus enhancing its dynamic character.

The main research process lasted for about four months, from November 2002 to February 2003. It was part of a larger EU funded research project, MEDACTION – Policies for Land Use to Combat Desertification (MEDACTION, 2004), concerning four northern Mediterranean countries, Greece, Italy, Spain, and Portugal. In total, 35 local stock breeders participated in the research process giving in-depth qualitative interviews, varying in duration from one to over three hours. Most of the interviews were conducted on an individual basis, but we organized three collective interviews as well (from eight to ten participants in each). The reasons for using this strategy are explained in the next part of the article. All interviews were recorded in addition to parallel extensive note-taking.

### **Getting Access and the Research Process in Western Lesvos, Greece**

*Getting access* in the field and contacting prospective participants for the research process was relatively easy, mainly because of the “open” character of the field and because of our prior knowledge of the island, specifically of the research area. The field can be characterized as “open” because the extent of negotiations between the researchers and prospective participants was minimal (Jorgensen, 1989). Nevertheless the research topic and its purpose was presented and explained in great detail to prospective participants. Anonymity was guaranteed and access to the results and various research reports were promised. These strategies helped in the development of trustful field relationships<sup>1</sup> and increased the richness and depth of information obtained through interviews<sup>2</sup> (Iosifides, 2002b). Almost all of the individual interviews were conducted at the interviewees’ homes whereas the collective interviews were organized at local cafes and municipality buildings.

The *selection of participants* was based on their production characteristics, their broad knowledge of local development and environment features, and on the time of their involvement in the primary sector in the area (usually over 10 years). Initially a series of individual interviews were conducted and at the end, three collective interviews were organized. The *combination* of these two interview strategies was adopted for the following reasons:

1. In order to capture not only individual stances and interpretations, but interactions between different participants on the same themes.
2. In order to increase validity and reliability of the research process. Views, attitudes, interpretations, and stances from individual interviews were put as themes during the collective gatherings and extensive debates followed. This helped in verifying some of the most important findings of the research and establishing the most crucial links between social processes and environmental issues in the area through the eyes of the local producers.

Although the notions and terms of “validity and reliability” are closely connected to quantitative approaches, they refer basically to certain quality criteria of the research process (Altheide & Johnson, 1994; Schwandt 2001; Steinke 2004). These notions take on a different meaning and have different repercussions in the case of qualitative research; as in this type of research there is no possibility and desirability of measuring validity or reliability. Nevertheless “qualitative research cannot exist without evaluation

criteria” (Steinke 2004, p. 185) such as, for example, inter-subject comprehensibility (justification of methodological choices and of analysis strategies), indication of the research process (sampling and actual research procedures, reflection on personal biases), and empirical foundation (relationship between data and theoretical statements, extreme case analysis). From the whole discussion in this paper, we made an effort to show the strategies we used to enhance the rigor and quality of the process. The most important of these strategies were the following:

1. We were very careful with the selection of participants in our research (sampling). As noted earlier the basic criterion was that of the duration of involvement in the primary sector. Additionally, we selected participants whose main profession was livestock breeding, and who lived all their lives in the area (western Lesvos). Furthermore we spread the selection process to as many local communities as possible (see Figure 1), to decrease the possibility of studying only the specificities of an individual case or community.
2. We used the information and data collected from interviewees as a thematic basis for conversation with other interviewees. This process helped significantly in the identification of common perspectives and interpretations in the area by constantly cross-checking data.
3. We emphasized exploring cases which did not fit into the overall picture. For example, a research participant connected desertification solely to the climatic conditions of western Lesvos. When we informed the interviewee that this connection was in contrast with the views of the majority of other interviewees he replied by saying that these views were “dangerous” because they may lead to government actions against the livestock sector and towards decreasing the number of grazing animals in the area! Further exploration of this interpretation showed, in extreme cases human responsibility for desertification was denied; this happened for defence reasons against socio-economic forces outside of the control of local producers.
4. We kept our ambitions of making theoretical statements and reaching final conclusions modest and in close accordance to data collected through the research process.
5. We were aware of our personal biases related to stances and actions of local producers in western Lesvos. Thus, rather than be critical of their stances and actions we tried to understand the socio-economic factors and mechanisms underpinning them and local producers’ multiple responses.

The research process ended when the research questions were satisfactorily addressed and when, after some time, the repetition of responses increased, reaching a certain degree of *saturation* of the process (Robson, 2002).

### **The Coding Framework**

Through in-depth qualitative interviews in the area of research (western Lesvos, Greece), rich and detailed information and data were collected, recorded, transcribed, and took a textual form. The *coding process* was the basis of data analysis and of the development of the conceptual model of interpretation and organization of findings (Miles & Huberman, 1994; Silverman, 2000; Weinberg, 2002). This process was initially based on the interview schedule, but it was constantly modified according to the actual

research process and the responses of interviewees. The final coding framework (*see Appendix*) for data segmentation and analysis was characterized by the following central features:

1. The framework was structured around five interlinked parent codes. Each parent code was divided in several sub codes.
2. The coding structure was thematic (Hay, 2000; Robson, 2002). This structure was the result of the combination of themes derived from the initial interview schedule and of themes emerging from data collected in the field.
3. Coding was the result of teamwork. Three coders (the two authors of this paper and a research assistant in the Department of Geography, University of the Aegean, Greece) were engaged in the process after a detailed *inter-coder agreement* on the definition and analytic description of each code, and of the type of data segments attached to them (Dey, 1993; Fielding & Lee, 1998). Initially the coders proceeded independently with different parts of the data and then they recoded data parts already coded by the others. At the end the team reached a final agreement on data segmentation and coding. Although the process was time consuming it produced a strong base for further analytical elaborations.
4. Apart from the base data, which are objective, the data segments coded in other codes and sub codes contained a combination of objective information (e.g., types of subsidies, participation in specific rural development programs), and subjective stances, opinions, and attitudes of the interviewees. Emphasis was given to the interviewee's perceptions of local socio-economic and environmental profiles as these perceptions have very practical implications on a series of matters of great importance (e.g., response and appreciation of policies, formation of priorities between production practices, and environmental protection).
5. Special emphasis was given to the linkages between different codes and sub codes in order to facilitate the gradual development of the overall conceptual model of interpretation of data. The linkages were established through extended analytical memos attached to each code and sub code.
6. We made an effort to keep data segments within the whole picture of the interview texts and not treat them in isolation from the overall discourse, from which they derived (Iosifides, 2002b). The complete avoidance of overlapping of data segments coded under different codes was impossible, and also undesirable. A certain degree of overlapping (for example data segments coded under the sub code "type of land ownership" and "production cost" at the same time) was needed in order to better facilitate the linkages between different notions, themes, and codes.

### **The Development of the Conceptual Model**

The coding process served as a basis for further analytical elaborations in order to develop a conceptual model for identifying the specific links between social processes and environmental performance in the area. These analytical techniques are briefly described below (Ratcliff, 2002; Robson, 2002).

## Taxonomy

After an initial typology of thematic areas, a more comprehensive taxonomic analysis followed. The purpose of this analysis was the gradual formation of central themes that emerged from data which were common in almost all interviews. The formation of these themes (presented in the Appendix) was the initial phase of analysis, towards the identification of the interlinked core categories.

## Constant Comparison

This type of analysis comprised the effort to establish linkages between different codes and sub codes, to find patterns and causal relationships between social processes, individual, or collective perceptions and social action (e.g., economic behavior, productive practices, and environmental priorities). The establishment of certain linkages between different thematic areas led to the gradual formation of a series of core categories (see Table 1). For example the linkages between low income, high production cost in the livestock sector, subsidy dependence and volume of grazing animal stock led to the formation of the core category, “low environmental protection priorities.” In another example, data collected about the negative implications of geographic distance to production cost and the final market prices for local livestock products, lead to the formation of the core category “geographical isolation – double peripherality.” This category proved to be a core one because it significantly contributes to the understanding of why the process of overgrazing in the area continues and why there is an extended lack of investments in land and soil conservation.

Table 1

### *Core Categories*

<p><i>Extended lack of land ownership rights</i></p> <p><i>Extremely high dependence on national and EU subsidies</i></p> <p><i>Negative balance between production cost and market prices of final products</i></p> <p><i>Geographical isolation – double peripherality</i></p> <p><i>Extended monoculture and relative lack of alternative employment and income opportunities</i></p> <p><i>Low environmental protection priorities</i></p> <p><i>Lack of resources and motives for investing in soil protection and conservation</i></p> <p><i>Unsustainable productive practices (mainly overgrazing and biomass firing)</i></p>
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Subsequently the core categories led to the development of a conceptual model (see Table 2). This development was dependent on the determination of which core category was causal, which category was an outcome or repercussion, and which category was both a causal factor and an effect. For example, the category, “extended lack of land ownership rights,” is a causal category for “negative balance between production cost and market prices of final products,” whereas the latter is a causal category both for “lack of resources and motives for investing in soil protection and conservation” and for “low environmental protection priorities.” This process of development of the conceptual model from data collected in the field was a cyclical one

as it entailed a constant review of raw data segmented in themes under the scheme presented in the Appendix. The final formation of the conceptual model contributes to the understanding of how socio-economic and spatial disadvantages of western Lesvos cause unsustainable production and natural resource use practices which reinforce the desertification and land degradation problems.

### **Hermeneutical Analysis**

Within this type of data analysis emphasis was given to individual and collective interpretations and perceptions, and more importantly, to the practical and action repercussions of these perceptions.

Through the above analysis strategies, a series of *core categories* emerged from the data (see Table 1). Most of these categories were not implicitly included in the initial coding framework, but developed gradually from the process of data analysis. In other words, these categories developed from a synthesis of a series of secondary categories and notions such as the number of animals grazing in the area, the pastureland rents and their implications to overall production cost, and the role of intermediaries in the formation of the final market prices of local livestock products. The identification of certain *linkages* between the core categories led to the construction of a theoretical/conceptual model of interpretation of the relationships between desertification and socio-economic dynamics in the area.

The most striking category to emerge from the data analysis was the concept of *geographical isolation* and *double peripherality*<sup>3</sup>. This concept is mentioned, stressed, and analyzed intensively by almost all interviewees and linked with all the other negative social, economic, development, and environmental aspects of the area. For the local producers “isolation” took a wide form of meaning. It meant, not only spatial distance from major production and consumption centers of the country, but also “negligence,” “abandonment,” and “powerlessness.” It revealed a widespread feeling among stockbreeders that they have extremely limited participation in the decision making processes that concern the development of the area and strengthens the notion (and the consequences) of the “peripheral” character of the area. To most of the participants in this research, western Lesvos is not only peripheral in relation to the rest of the country, but also in relation to the rest of the island of Lesvos as well (and especially its capital, Mytilini).

Isolation and peripherality are directly linked to the negative local development trajectory, and with the lack of implementation of a comprehensive sustainable development policy framework, aimed at supporting the creation of alternative income and employment opportunities in western Lesvos. Although it is widely recognized by the interviewees that natural resources and land in the area are fragile and need protection and conservation, environmental priorities remain relatively low because of intense socio-economic reproduction needs and land owning structure. Thus the pressure on land and unsustainable productive practices continue. Furthermore, the widespread dependence on national and EU subsidies (which are granted to local producers according to number of animals owned) contributes substantially to excessive pressure on soil resources through overgrazing. According to Arianoutsou-Faraggitaki (1985):

The case of Lesvos island is typical of many situations in Greece. A total of 213.000 sheep and goats graze over the total area, with 67 per cent of the population located on its western part, where the greatest utilization occurs. The grazing activities are unconstrained so that, theoretically, an area of 3500 m<sup>2</sup> is available to each feeding animal. The degree of grazing pressure on the natural ecosystems is very high and gradually causes deterioration. (p. 237)

Table 2 summarizes the basic features of the developed conceptual model and major findings. This model was the result of the entire data analysis process. Its central purpose was to link socio-economic and local development trajectory of the area to unsustainable production practices that cause or exacerbate the problems of land degradation and desertification.

Table 2  
*Basic Features of the Conceptual Model*

<b>Major Driving Forces (socio-economic and spatial disadvantages)</b>	<b>Production Practices and Environmental Protection Priorities</b>	<b>Land Degradation and Desertification</b>
Lack of alternative sources of income in the area	Land use change from farming to the more unsustainable use of land grazing	Extended lack of knowledge about the problems of land degradation and desertification
High degree of dependence on the primary sector (stock breeding)	Overgrazing of sensitive land (the combination of subsidy dependence, unfavorable socio-economic environment and lack of alternative sources of income and employment results in excessive use of natural resources and overgrazing)	Problems in dissemination of information on the problems of desertification and land degradation from national and local/regional agencies to the local population. Lack of an integrated policy framework for combating these problems in cooperation with local population and taking into account the particularities and social needs in the area
High production cost because of geographic distance (affecting input prices) and land ownership structure (high degree of dependence on rented land for grazing)	Land abandonment due to migration from western Lesvos	
Unsatisfactory final product prices because of geographic distance and lack of sufficient competition among major product buyers in the area	Low environmental and land conservation priorities among the local producers due to socio-economic disadvantages,	Land use change and especially overgrazing result in exacerbating the problems of land

Almost total dependence on national and EU subsidies for income.	lack of financial incentives and extended lack of land ownership	degradation and desertification in a land type (and in combination with unfavorable climatic conditions) of an environmentally critical state
Uneasy relations between local and regional agencies and bodies		

### Conclusions

It was not our aim to present the findings of our research in depth in this article. Our main purpose was to raise some important issues on methodological and data analysis strategies on a research theme, such as the social dimensions of desertification and land degradation. Our experience in the field strengthened our view of qualitative research as a *strong tool* for investigating complex socio-environmental problems and identifying the crucial role of local knowledge for mitigating these problems.

Thus our research contributed to the specific connection of desertification to human factors and socio-economic forces, identifying the respective linking mechanisms, and thus opposing the widespread commonsensical logic that desertification and land degradation are solely climatic or natural driven processes. Furthermore, our research revealed the complexity of socio-environmental problems such as degradation and desertification by identifying the downward spiral of socio-economic disadvantage and environmental deterioration. This point is very important, as in other cases desertification occurs in wealthy communities or it is a result of land abandonment (MEDACTION, 2004). Finally, our research in western Lesvos shows that local producers are not careless or indifferent in regards to natural resources quality or environmental protection, but "entrapped" within the above mentioned downward spiral. The last notion opens new and equally interesting possibilities for conducting further qualitative research in the area. These new possibilities are related to conducting action research with local populations, aimed at their emancipation and active participation in local development policy making, and forming and implementing a new local framework of socio-economic diversification and sustainability.

Our research in western Lesvos also revealed that one of the most important reasons for policy failure, in cases like this, is the neglect of the above notions and inadequate addressing of broad socio-economic causes by the adoption of a narrow technical-technocratic approach (MEDACTION, 2004). Although this research was conducted in western Lesvos, Greece, it could have further implications and it could increase our understanding of socio-environmental processes in areas with similar socio-economic and land characteristics, especially in rural areas such as the north Mediterranean. What happens to western Lesvos may be analogous to what happens to other socio-economically deprived areas of north Mediterranean and thus the need for combating desertification would be met not in isolation but in close linkage to combating other crucial socio-economic problems.

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## Appendix

### The Coding Framework

**Base Data** (Base data contain objective information either about the production unit or about the interview)

Type of Production (*The type of production for all interviews was sheep-raising*)

Type of land ownership

Rented

Private

Mixed

Size of unit (*Size in terms of number of animals*)

Area of production (*The broad area for all interviews was western Lesvos. This sub code concerns the specific community of production*)

Duration (*Number of years of involvement in the primary sector*)

Structure of work (*Family work, salaried work*)

Gender and age of interviewee

Location and duration of interview

### **Rural Development and Rural Policies**

Government and EU policies

Age restructuring policies

Positive stance

Negative or neutral stance

Participation

Knowledge

Production cost

Distance

Input prices

Land rent

Intermediaries

Subsidies

Positive stance

Negative or neutral stance

Temporal variation

Product prices

Positive stance

Negative or neutral stance

Temporal variation

Cooperatives

Positive stance

Negative or neutral stance

Local and regional agencies and bodies

Positive stance

Negative or neutral stance

Rural development programs

Positive stance

Negative or neutral stance

Participation

Knowledge

Social infrastructure (*health and education*)

Positive stance

Negative or neutral stance

Proposals

### **Socio-Economic and Spatial Conditions**

Economic problems and income

Social problems

Unemployment and underemployment

Poverty

Social infrastructure

Other

Demography and migration

In-migration

Out-migration

Life conditions and causes of staying in the area

Local development

Problems

Proposals

Geographical features

### **Survival Strategies**

Alternative employment and income pool

Tourism

Secondary sector

Other

Social networks and solidarity

### **Desertification and Land Degradation**

Knowledge of the problems

Information about the problems

Causes and interpretations

Evaluation of the role of human factor

Land use and land use change

Productive practices

Natural resource conditions

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### **Author Note**

Theodoros Iosifides is a sociologist and a human geographer. He holds a BA in Sociology and an MA in Regional Development from Panteion University of Athens. He holds a doctorate in Human Geography from the University of Sussex, UK. He currently lectures in social science methods at the Department of Geography, University of the Aegean, Lesvos, Greece. He can be contacted at the Department of Geography, University of the Aegean, University Hill, 81100, Mytilini, Lesvos, Greece; E-mail: [iwsifidis@aegean.gr](mailto:iwsifidis@aegean.gr).

Theodoros Politidis is an historian and holds an MA in Geography from the University of the Aegean, Lesvos, Greece. He can be contacted via E-mail: [tpolit@aegean.gr](mailto:tpolit@aegean.gr).

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## Notes

<sup>1</sup> The development of trustful field relationships between the researchers and the research participants became possible due to a series of reasons. The first reason is related to our personal relationships with several local producers in western Lesvos, as one member of our research team is of Lesvos descent. The second reason is related to full explanation of our research purposes to prospective participants and to the fact that our research was conducted within a project associated with the University of the Aegean, Lesvos, Greece (Department of Geography). The latter proved to be crucial in the willingness of local producers to participate actively in the research process as the University enjoys a high reputation among the island's population. In contrast, it must be noted, that there is extended distrust among the local producers for actions and initiatives which come from local / regional and national official agencies and bodies.

<sup>2</sup> The richness of data obtained through the interview research process is mainly related to detailed information collected both on substantive issues (e.g., production cost, animal numbers in the area) and on personal and collective interpretations, opinions and stances about the links between social conditions and desertification. Although the extended presentation of data collected in the field is not the primary purpose of this paper, these data refer mainly to four broad areas. The first area is related to the characteristics of local livestock production. We collected information on the size of production units, on the labour structure of livestock production, on land ownership features and its implications to production cost and on attitudes towards the present state and future prospects of working in this sector. About land ownership,

“We rent a lot of graze land here from individual land owners and from the municipality. Rents are high for us and they are set up according to size and animal numbers. For 50 animals I pay the value of about 2.5 metric tons of milk per year” (from interview with a local producer in Hidira, western Lesvos, translation from Greek by the authors).

The second area concerned socio-economic conditions in western Lesvos. We collected information about economic and income generation matters, income satisfaction levels, underemployment and unemployment in the area and the role of immigrant labour in maintaining production capacity. For example about income and satisfaction from income,

My income is not satisfactory at all given the time I spend at work. I get up at five every morning and work until the afternoon. The final prices for milk and meat have not changed in the last 10 years. (From an interview with a local producer in Eresos, western Lesvos, translation from Greek by the authors).

The third area was related to rural development and to respective policies. Interviewees talked extensively about the role of geographic distance in increased production cost and low income, the extended lack of pastureland rights in the area, the

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almost total dependence of livestock production on national and EU subsidies, the lack of alternative income and employment sources outside the livestock sector and about their sense of “abandonment” of the area from official policy making agencies at local and national levels. For example, about geographic distance,

We are isolated even from Mytilini. There is a large difference in problem solving as regards distance. We are 100 kilometers away from Mytilini and all agencies. For example, I am building a house now and had to contact the Archeological Agency in order to come here and check the site. They came after 20 days. (From interview with a local producer in Eresos, western Lesvos, translation from Greek by the authors).

And about the role of subsidies,

Without subsidies we would be all lost. Twenty years ago there were 6-7.000 animals here. Now the cooperative has about 17.000 animals. (From interview with a local producer in Vatousa, western Lesvos, translation from Greek by the authors).

Finally, the fourth area is related to production practices and their linkages to the problems of land degradation and desertification. Local producers characteristically called their socio-environmental situation a “trap.” Although they are highly concerned for the gradual deterioration of soil quality and productivity in the area, their environmental protection and soil conservation priorities are quite low because of survival and social reproduction factors and because of their total dependence on a traditional, labour intensive livestock sector. For example, about production practices and overgrazing:

This part of land is appropriate for 50 animals but they graze about 200 and still income is not enough. You see it [the sheep]; it scratches the rock in order to find some grass. Fortunately this winter it rains a lot. In previous years there was drought. They used [the sheep] to scratch the soil. You feel pity for the animals. (From interview with a local producer in Eresos, western Lesvos, translation from Greek by the authors).

Almost all interviewees connected the mitigation of desertification and land degradation problems in the area with an overall alteration of the basic socio-economic features of western Lesvos. On this crucial point they proceeded to specific proposals which are mainly related to the promotion of alternative local employment opportunities outside the primary sector, to the modernization of livestock sector and to the creation of a special financial support framework towards decreasing production cost and channeling funds to land and soil conservation investments. Under these conditions the excessive pressure on land (mainly through overgrazing) would be significantly lessened and desertification processes would, in the long run, be reversed.

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<sup>3</sup> Geographical isolation is highly connected to the notion of double peripherality but the latter is characterized by an additional meaning. It means not only peripherality and isolation of western Lesvos from major decision making centers and markets of Greece (such as for example Athens and Thessaloniki) but also peripherality and isolation from the capital of the island of Lesvos itself (Mytilini). Thus double peripherality refers to the subordinate position of western Lesvos in relation to different spatial scales (national and regional/local scales).

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