

**The Evolution of Rural Livelihood Systems,
Including Options on Organic Farming:
A Case Study from the Messara Plain of Crete**

**Habtemariam Kassa, David Gibbon, Erik A. Hult,
Houmchitsavath Sodarak, Mohamed Salih and Jutarart Ramasoota***

Abstract

The paper presents findings of a field study undertaken in May 1999 on the Greek Island of Crete. The objectives of the study were to explore how agricultural activities and the livelihood systems of small farmers have been modified with the development of tourism and the implementation of the Common Agricultural Policy of the European Union. The study also assessed farmers' views on, and experience with, organic farming as a potentially viable alternative livelihood strategy. The study used participatory research methods to investigate changes in livelihood systems, farmers' views on organic farming and to study the impact of the institutions that related to agriculture. In the study area, agriculture was becoming increasingly a part-time occupation as farmers endeavoured to diversify their livelihood systems through increased engagement in the service sector, particularly during the tourist season. The extended family links were being used to diversify and modify agricultural activities to fit with the activities in the service sector. By this means, farmers were able to diversify their livelihood systems and add value to their products. Though both conventional and organic farmers agreed on the major problems that they faced, they differed widely in their perceptions about organic farming as a viable future option. It was also learnt that there existed gaps among institutions interested in agriculture in the study area. It is suggested that further, open and interactive studies are necessary to fill in such gaps and to help farmers more effectively, particularly in addressing marketing problems, and to examine the potential future for organic farming.

Key Words: *Organic farming, livelihood systems, smallholders, participatory research methods, Crete*

* Habtemariam Kassa, Erik A. Hult, Department of Rural Development Studies, Swedish University of Agricultural Sciences, P.O. Box 7005, SE- 750 07 Uppsala, Sweden. Correspondence should be addressed to the first author.

David Gibbon, The Spinney, Trow Hall Drive, Trow Hill, Sidford, Sidmouth, Devon. EX10 0PW. UK

Houmchitsavath Sodarak, Forestry Office, P.O. Box 487, Luang Prabang Province, Laos
Mohamed Salih and Jutarart Ramasoota Division of Occupational and Environmental Medicine, Ministry of Public Health, Tiwanon rd., Nonthaburi 11000, Thailand

Introduction

The paper presents and discusses the findings of a field study undertaken in May 1999 by an interdisciplinary team. The rationale for the study was the need for a better understanding of farmers' views on changes in their livelihood systems as a contribution towards the design of more appropriate research and development strategies that might assist small farmers improve their wellbeing and take better care of the environment. The first objective of the study was to explore the changes in livelihood systems of smallholder farms of the Messara Plain of Crete which had been brought about, both by the implementation of the Common Agricultural Policy (CAP) of the European Union (EU), and with the growing importance of the tourism industry in the area. The second objective was to assess the views of farmers on what they see in the potential for organic farming and whether it would be a feasible option in the face of these changes. Accordingly, the strategies of smallholder farmers to sustain their livelihood systems in the face of major external forces were examined, the views of conventional and organic farmers on organic farming assessed, and linkages between institutions involved in agriculture explored. As the focus has been on the study of changes in the livelihood system, the section below provides a brief background to the study of livelihood systems.

Studying Livelihood Systems

The interest in the study of livelihood systems grew as researchers realised that farming was not the only means available for the rural people to make a living. Earlier practitioners of Farming Systems Research used the term "livelihood system" to describe the complex and diversified undertakings of rural people in their efforts to earn a living. Currently, people's livelihood is understood to comprise the capabilities and capital assets (including material, human and social resources) and activities a concept which unites economic development, reduced vulnerability, and environmental sustainability (Ashley, 2000; Ashley and Carney, 1999; Carney, 1998; Chambers and Conway, 1992). Farmers constantly adjust their on-farm and off-farm activities in face of major changes, and understanding such changes in livelihood systems remains critical if development measures are to succeed (DFID, 1999). Accordingly, a sustainable livelihoods (SL) approach as a method of analysis of livelihood systems is being widely used by development practitioners, donors, and UN agencies. A sustainable livelihoods approach is understood to be a way of thinking about the objectives and priorities of development in view of increasing effectiveness both in improving human welfare and in protecting and improving the management of natural and physical environment (Chambers and Conway, 1992; DFID, 1999).

Analysis of changes in livelihood systems calls not only for identifying the driving forces of agricultural intensification (Boserup, 1965; Mc Intire et al, 1992; Pingali et al, 1987) but also for the prevailing opportunities for off-farm and non-farm activities (Chambers and Conway, 1992). Such studies should

encompass the socio-economic, political and institutional factors influencing decision making by smallholder farmers. In this particular study the focus has been on the influence of policies. Changes in policies influence land use patterns and the intensity of land use (Lele and Stone, 1989) through changes in the allocation of resources, notably labour and capital (Hayami and Ruttan, 1985). Understanding the changes in livelihood systems of people as a result of policy implementation is necessary in order to design appropriate intervention or support measures that are adoptable and sustainable. Lack of appropriate policies and ineffective institutions not only hinder the promotion of certain desired activities, for example organic farming, but may also lead to environmental degradation (Lele and Stone; 1989; Binswanger and Deininger, 1997).

The livelihood approach prompts exploratory thinking, especially about the links between the micro and the macro levels, where the effects on people's livelihoods of policies and institutions are closely examined (DFID, 1999). While conducting a rapid livelihood analysis, heavy emphasis is therefore laid on understanding how existing structures and processes influence people's choice of livelihood strategies. Depending on the issue to be studied, and the objective of the study, livelihood analysis makes use of both qualitative and quantitative research methods. A typical sequence for a qualitative method field level SL analysis is key informants interview, one or more group meetings and participatory work to ascertain the validity and significance of findings, and to assess any variation in opinion across groups. This particular study primarily employed qualitative methods as the objective was to get a broader understanding of major issues and their implications. With regard to organic farming, the study was limited to exploring farmers' views on meaning and feasibility, and hence the more holistic approaches to the study of organic farming as suggested by Nigali (1999) were not employed.

It is with this rationale and methodological framework that this study was conducted in the south central part of the Crete Island of Greece. The following sections describe the study area and the methods employed, present the major findings, and provide concluding remarks on major issues observed.

Methodology

The Study Area

The study was undertaken in Crete, one of the 13 regions and the most southerly of the Greek islands. Crete is situated in the Southern Aegean Sea at the crossroads of the three continents of Europe, Asia and Africa. It is the biggest island in Greece, covering an area of 8,336 km² (<http://www.interkriti.org/intro.html>).

A high mountain range crosses the island from west to east. Crete is known for the quality of its agricultural products, the main ones of which are olives, grapes, tomatoes, oranges, honey, pharmaceutical and aromatic plants and herbs. While crop production dominates in plains and valleys, sheep and goat production for milk, wool and meat remains an important activity in the hillsides and mountain

plateaux (<http://www.interkriti.org/intro.html>). The island is also an attractive tourist destination, and as a result, since the emergence of tourism in the 1970's, all three sectors of the economy have become interconnected (Kabourakis, 1996)

Crete is divided into four prefectures, one of which is Heraklion. Given the significance of agriculture to the livelihoods of people and the growing importance of tourism in the Heraklion Prefecture (Kabourakis, 1996), this part of the island was selected for the study. The Messara valley in the Heraklion prefecture is considered as the most important agricultural area of the island, where intensive agricultural production is taking place. The specific study site was the Pitsida community in the Messara Plain located 65 km south-west of Heraklion, at an altitude of 80 m.a.s.l., adjacent to the nearby resort areas of Komos and Matala beaches.

Methods

The study was undertaken in May 1999, by an interdisciplinary team of six composed of three agriculturalists one economist, one forester, and one public health specialist. The research team employed an array of participatory research methods and tools, including key informant and semi-structured interviews, rankings, timelines, calendars, transect walks and activity charts. The team continuously made triangulation, reflected on observations, assessed findings, and refocused areas where additional information was to be sought. The study concentrated on farms in the valley and the hillsides, and focused on crop agriculture, particularly olives for oil and table, grape production for both wine and raisins and on greenhouse horticulture production. The study also included two livestock keepers. Organic farmers and conventional farmers were interviewed concerning their perceptions about organic farming, motives for converting to organic farming, the feasibility of organic farming in the future, and about the institutions to which they were connected. A total of 15 interviews were made with farmers and representatives of institutions. Eight of the interviews were conducted with farming families. The majority of farmers interviewed were also engaged in off-farm activities.

Results and discussion

Diverse Farming Systems with Tendencies to Specialize

The study revealed the existence of a diversity of farming systems, from transhumance livestock production to intensive greenhouse horticulture production. Sheep and goat rearing, based on grazing and transhumance, was prevalent on the mountains, while hillsides and valleys were used primarily for crop farming, mainly olive and horticulture production. These diversified farming systems, however, were shifting towards specialised farming. The move towards specialisation seems to be taking place in both directions of intensive farming, as is the case in greenhouse horticulture production, and extensive production nota-

bly for some olive producers, and sheep or goat farmers who intend to expand. The major driving forces for such changes have been the growing importance of tourism in the area and the impact of CAP of EU. Since its inception in 1962, CAP has been attempting to support the income of European farmers. Its support, however, is designed to increase agricultural productivity through the exploitation of comparative advantages of member countries, to encourage free flow of agricultural commodities within the EU, to ensure reasonable prices to consumers and to stabilise markets. To attain these objectives, EU uses policy instruments that include agricultural price support, direct payments to farmers, and supply controls. Through such policy instruments CAP continues to influence smallholder farm enterprises similar to those on the Messara Plain in Crete.

Changing Livelihood Systems: The Agriculture-Tourism Interface

The high unemployment rate in the 1960s and 70s made the Cretan population largely dependent upon employment opportunities abroad or working as seamen on big freighter ships, as Greece had an important role in marine transport at the time (<http://www.interkriti.org/intro.html>). Those opportunities have declined over time, and more and more elderly people have returned to farm their lands.

In the coastal areas, the effect of tourism was visible. The presence of a number of restaurants and taverns, family hotels and pensions, exchange and tourist offices, shops and boutiques, suggests that the growing tourism industry in the area was creating additional job opportunities. Consequently, thanks to tourism, Crete has currently the lowest unemployment percentage in Greece, about 4 % (<http://www.interkriti.org/intro.html>). Nevertheless, it worth nothing that as the tourist industry is a seasonal activity, many were involved in it on part-time basis. With the growing importance of tourism, agriculture was also undergoing major changes and becoming more of a seasonal occupation. Many farmers expressed their intention not to be engaged in agricultural activities that would not allow them to go and work elsewhere during the tourist season. Thus, crop and animal farming activities that required full-time commitment were being replaced by farming methods, which allow such diversification.

By superimposing the mobility map with the daily activity chart, diversified activities of farmers could be visualised. Figure 1 presents an example from a part-time farmer who is an employee at a nearby Research Station, and manages five farm plots located at different sites. Though he did not know the distances between sites, he knew from the kilometre reader of his truck that he was covering an estimated distance of 2,000 kilometres each month in his effort to carry on both activities.

Declining Farm Sizes

The land tenure and taxation system appeared to play an important role in influencing farm size. The inheritance system offers all children, sons and daughters, equal rights to inherit land. The tax system favours the small holding as only the large holding is liable for taxation. Land ownership commands a great

deal of significance in the cultural value system, and it is unusual to buy land from family members in order to consolidate. Thus, people maintain ownership of their land, even during their absence, and some return to farming at a later age. The island customs discourage land consolidation, and therefore lead to increased fragmentation and decline in farm size. This partially explains the high number of small land-parcels prevailing in the study area (see Table 1). Nevertheless, whether declining land holding is hampering intensification, or whether intensification and sub-division is leading to smaller farm size, requires further investigation, particularly in green house cultivation.

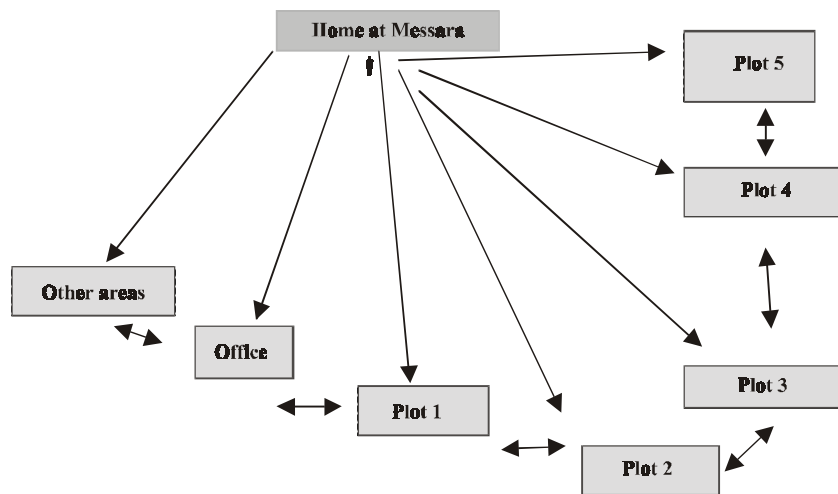


Figure 1. Mobility map of a part-time farmer

NB. The farmer does not know the exact distances between his plots and office, but he records a distance of over 2000km a month travelled in his vehicle

Table 1. The 1991 average number of parcels and farm and parcel sizes of Heraklion Prefecture, the Crete island and Greece (Statistical Yearbook, 1999).

	<i>Heraklion</i>	<i>Crete*</i>	<i>Greece</i>
Average number of parcels	8.6	7.4	6.0
Average size of parcels (ha)	0.41	0.75	0.72
Average farm size (ha)	3.5	5.4	4.3

* Excluding Heraklion

The Agriculture-Extended Family Business Linkages

In response to the increasing competition in the tourist industry as well as the agricultural sector, some farmers began diversifying agriculture and integrating it with the service sector, using their extended family links. One such farmer began dairy goat production with the assistance he received from EU, and also owns olive trees (Figure 2). His wife's grand parents rear sheep and rabbits, and process milk produced both from their own sheep and from his goats. His parents-in-law have a bed and breakfast business. In addition to this, his father owns a restaurant where both he and his wife work. The restaurant gets lamb, kids, rabbits, cheese, eggs, and poultry from his farm, and from the farm of his wife's grand parents. By so doing, the extended family increases the 'value added' effect of their farm products.

This increasing diversification of livelihood systems, and the growing integration of farming activities with the service sector through family networks, is illustrated in the extended family activity chart in Figure 3. This was the family of a key respondent of the study team. One can see from this the growing importance of the service sector over agriculture across generations.

Different Views on Organic Farming

Organic farming in Crete has a recent history. It began in the early 1990s with a few interested farmers. The "Organic Farmers co-operative of Messara" was established in 1994. In 1999 its members reached 125 (CAEG, 1998). The co-operative currently produces mainly organic olives and grapes, members plan to start the production of citrus, vegetable and horticultural products as well as livestock products. Although the requirements appeared to be that of the EU regulations on organic farming (Kabourakis, 1996), the general understanding of farmers about what organic farming means, was limited to the knowledge of restrictions regarding the use fertilisers and pesticides.

Organic foods should be processed minimally in order to maintain the integrity of the food, and they should not be exposed to irradiation nor should they contain residues, artificial ingredients or preservatives (OFPRI, 2001). Consequently, organic farming is defined as an ecologically sound production system that employs methods to reduce residues in food products, to minimise pollution of air, water and soil; and to restore, maintain and enhance biodiversity, soil biological activity and ecological harmony (National Organic Standards Board of US, 1995 cited in OFRF, 2001). Thus, organic farming could be considered as a system of production that follows a set of rules in order to meet the strict requirements of the environmentally and health-conscious consumers in the developed world, implying also the need for mechanisms to certify adherence to these rules. Scialabba (2000) notes that such rules make organic farming a regulated form of ecological agriculture, where the continuum from farm to the consumer table is ensured. It therefore excludes traditional production systems from being considered as organic farming, even if they do not use synthetic agricultural chemicals or soil building materials (Scialabba, 2000).

Time	Daily activities
5:00	🕒 Wakes up and drives to the goat farm on the mountain
5.30 – 8:30	Feeding and milking goats
8:00 – 11:00	Transport milk to his parents in-law, and makes cheese there
11:00 – 12:00	↔ Rest time
12:00 – 15:00	🕒 Working at the family restaurant ↓
15:00 – 18:00	Works in the olive farm / pruning, watering, etc. (Three times a week he plays football)
18:00 – 19:00	↔ Rest time
19:00 – 24:00	↓ 🕒 Working at the family restaurant
24:00 – 5:00	↔ Rest time

Figure 2. A 24-hours activity chart of a part-time farmer

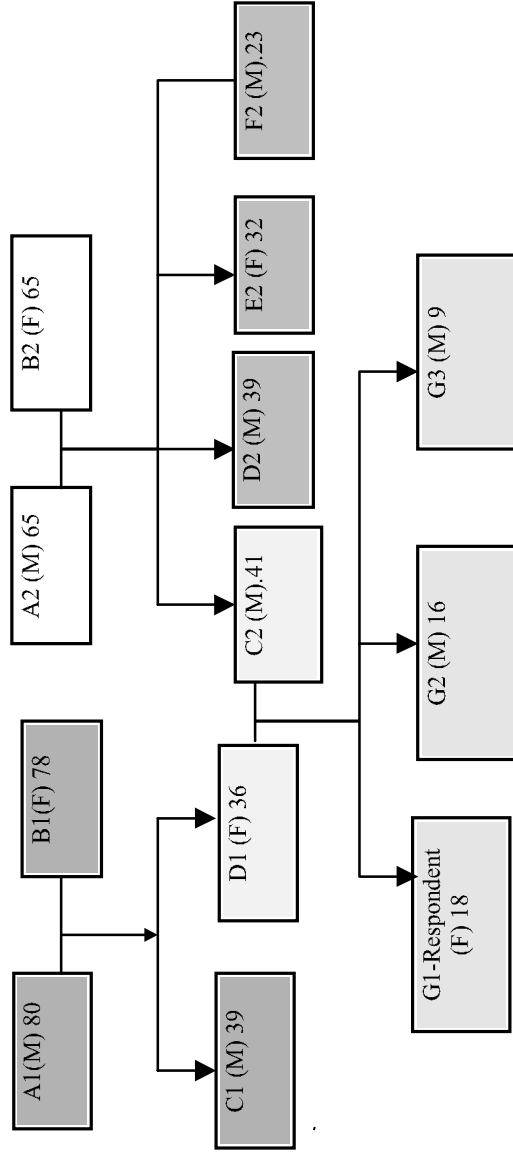


Figure 3. Extended family activity chart

	Relationship to G1	Activities		
		Earlier	At Present	Plan for Future
A1	Grand father	- Olive trees	(Died).	
B1	Grand mother	- Raise hens, rabbits - Manage small shop	- Raise hens and rabbits, - Manage small shop	- the same as present
A2	Grand father	- Worked in Germany	- Olive trees - Greenhouse	- Continue with similar activities
B2	Grand mother	- Olive trees	- Greenhouse - Raise hens and rabbits.	- Continue with similar activities
C1	Uncle	- Work at a pub in summer and at olive farm in the winter	- Same as earlier	- Continue with similar activities and look for additional employment
D1	Mother	- Manage guesthouse, coffee shop and mini-market	- Same as earlier	- Continue with similar activities
C2	Father	- Bus driver in summer and in coffee shop in winter	- Same as earlier	- Continue with similar activities
D2	Uncle	- Bus driver	- Same as earlier	- Continue with similar activities
E2	Aunt	- Works year round at two restaurants	- Same as earlier	- Continue with similar activities
F2	Uncle	- Worked on-farm	- Work at restaurant	- Look for another job
G1	Herself	- In school	- Language school - Coffee shop/mini- market.	- To work as a tourist guide
G2	Brother		- School - Coffee shop/ mini market	- To join a University
G3	Brother		- School	- Finish school

In the light of this, it seems that there is a need to further clarify to farmers in Crete what organic farming is all about. In this regard, farmers noted the positive role of the Cretan Agricultural and Environmental Group (CAEG - a foundation established by farmers, agronomists, researchers and consumers in 1994) to clarify the directives of EU on organic farming, and to assist them in the registration and inspection processes. Inspection and certification of organic products are carried out by another organisation, named DIO. It was not possible however, to be certified as an organic farmer in animal production, as the Greece Ministry of Agriculture is still working on the regulations concerning organic animal production (Kabourakis, 1999, personal communication).

The views of organic farmers and those of conventional farmers, differed concerning the major motives for becoming engaged in organic farming, the future of agriculture in general and that of organic farming in particular. Organic farmers raised environmental concerns, personal healthcare, and better prices for organic products, in their descending order of importance, as the major motives engagement in organic farming. Some farmers pointed out that the field trip organised by the University of Heraklion to visit organic farmers in the Netherlands, and the discussion that they had with those farmers were critical in developing their confidence on organic farming.

Conventional farmers believed that temporary price differentials and other economic incentives were the determinant motives for organic farmers. Scialabba (2000) also observes that growing demand for organic food products in the developed nations is the main drive for farmers to produce organic products. Many conventional farmers had the opinion that it would be impossible to produce enough to make a living without the use of chemical fertilisers and pesticides. Some conventional farmers doubted the sincerity of their colleagues engaged in organic farming.

The views of the two groups of farmers also differed concerning the future of organic farming. Organic farmers thought that conventional farming would be squeezed further, due to declining farm subsidies and severe international competition, whereas organic farming would have brighter future provided that farmers make more efforts to improve their labour and technical efficiency, and that new export markets for organic products could be sought and the existing market niches maintained. Organic farmers also emphasised the need to protect the environment, and the advantages for their families in growing and consuming healthy food. Some farmers considered this along with reduced exposure to agricultural chemicals, as an improvement in their quality of life. Conventional farmers, on the other hand, believed that organic farming was less likely to be a feasible option in the future, as the current high prices for organic products would no longer be maintained when the volume of organic products in the market increases.

Though both groups of farmers differed in their views on organic farming, they agreed on the major problems they face. These communally shared problems were marketing, declining farm size, and infrastructure problems that affect agriculture at large. They also stressed that their children were not interested in becoming farmers. Nevertheless, if the farming systems were diverse, so were

the specific problems the farmers were facing. For example, for the conventional sheep and goat farmers, the main problems were animal theft and lack of investment capital for farm expansion, in order to become more competitive. For greenhouse vegetable producers, low farm gate prices and higher costs of inputs and labour were identified as the main problems.

Though slight variations may exist in the order of importance of problems for organic farmers engaged in olive, grape or vegetable production, Table 2 summarises the specific problems that many organic farmers faced. A group of organic farmers identified and ranked these problems, and then stated the corresponding measures they normally take to tackle these problems.

Table 2. Problems of organic farmers in their descending order of importance and the corresponding measures.

Problem	Reason	Remedial Measures
1. Diseases and pests (snails on young seedlings of olive and grape)	The natural ecosystem balance affected (e.g. marshes drained thus few wild ducks left to control snails)	Manual control and use of extracts of herbs such as stinging nettle (<i>Urtica urens</i>), garlic, etc.
2. Market	Getting good prices in order to stay in business	More effort by themselves to maintain the existing market and find new ones
3. Olive fly	Affects the quality and quantity of olive production	Use of liquid scent traps
4. Proximity to conventional farm plots	Chemicals spill-over; both neighbours consider each other's plots as source of, and refuge for crop pests	None for the time being
5. Fragmentation of plots and land size	Expensive to manage and difficulty to integrate livestock and have a mixed farm	Consolidation may help, but speculation on land and the current taxation system make consolidation a difficult option.
6. Labour	Disease and pest control demands more time	None for the time being

The marketing problem referred to the ability to find, and build enough capacity to remain in, new markets. This implies the capacity to produce organic products that would meet quantitative and qualitative demands of the market and would still be cheaper than conventionally grown products. The importance of

addressing marketing problems is essential if organic farming is to constitute a viable alternative in the changing livelihood systems of farmers in the area.

With regard to labour, many farmers felt that organic farming demanded more labour than conventional farming. A closer look at the seasonal labour patterns of organic farmers shows that they do indeed spend a great deal of their time working on the farms. Figure 4 summaries the seasonal calendar of activities of a woman organic farmer and Figure 5 shows the seasonal activities for a part time male farmer. It is worth noting that farming practices that are not flexible enough to release labour during the tourist season are likely to severely limit farmers' involvement in off-farm activities during that time.

The discussion with conventional and organic farmers also included a SWOT (strength, weakness, opportunities and threats) analysis of conventional and organic farming. This method is ideal for opening up a debate among groups of farmers in order to contract alternative strategies and to fully explore the attributes of each. Table 3 presents the results and highlights both similarities and differences in the alternative systems.

Month	Organic Olive	Organic Grape	Organic Garden
Jan	End of harvest	Pruning	Preparing land
Feb	Pruning	↓	
March	Cultivation of green manure	Cut off small branches	Seedlings
April	↓	Spraying	Final planting
May	Irrigation Traps for olive fly	Irrigation ↓	
June			
July		Harvest of fresh grapes	Seedlings
Aug	↓		Planting potatoes and winter crops
Sep		Harvest for wine	
Oct		↓	
Nov	Start of harvest		
Dec	↓		

Figure 4. Seasonal calendar of a woman farmer engaged in organic farming.

Month	Organic Olive	Organic Grape	Seasons	Tourism Season
Jan	End of harvest	1 st Pruning		
Feb	Pruning & chopping			
March	Cultivation of green manure ↓	↓		
April	Olive flowering	Last Pruning 15 May		
May	Irrigation	Irrigation		
June	↓	↓		
July				
Aug	Cultivation	Grape ripe – harvest for raisins		
Sep	↓			
Oct				
Nov	Start of harvest Green manure	Green manure and animal manure		
Dec	↓	↓		

Figure 5. Seasonal calendar of a part-time male organic farmer

Table 3. SWOT analysis of the major farming systems

	Strengths	Weakness
Organic farming in general	<ul style="list-style-type: none"> - less dependant on input supply - growing market and better prices for organic products - positive role for personal and environmental health 	<ul style="list-style-type: none"> - more labour intensive - location (amongst conventional farms) and fragmentation of land - difficulty of pest and disease control
<i>Grape producers</i>	<ul style="list-style-type: none"> - niche markets and better prices - labour calendar fits with tourism 	<ul style="list-style-type: none"> - problem with snails - weed and pest control difficult
<i>Olive producers</i>	<ul style="list-style-type: none"> - higher and stable prices - safe pest control - labour calendar fits with tourism 	<ul style="list-style-type: none"> - problem with snails for seedlings - olive fly affects quality and quantity
Conventional farming in general	<ul style="list-style-type: none"> - easier and cheaper pest and weed control - benefit from economies of scale 	<ul style="list-style-type: none"> - high cost for input supplies - negative environmental effects - severe market competition
<i>Greenhouse vegetable production</i>	<ul style="list-style-type: none"> - early production enables higher prices - less land area needed 	<ul style="list-style-type: none"> - in future prices may decline - high cost for input/materials - labour tied during tourist season
<i>Animal farms</i>	<ul style="list-style-type: none"> - higher profit from processed and end-products - use marginal areas 	<ul style="list-style-type: none"> - high risk of theft - feed shortage and land degradation - labour tied during tourist season
	Opportunities	Threats
Organic farming in general	<ul style="list-style-type: none"> - expanding export market - new knowledge and techniques - environmentally friendly tourism - integration with tourism 	<ul style="list-style-type: none"> - decline in support and subsidies - increased competition - declining prices - difficult to manage on part-time
<i>Grape producers</i>	<ul style="list-style-type: none"> - increasing demand for locally produced organic wine 	<ul style="list-style-type: none"> - increasing incidences of disease- and pests
<i>Olive producers</i>	<ul style="list-style-type: none"> - health related increasing demand for table olive and oil 	<ul style="list-style-type: none"> - new competitors entering the market (from other countries)
Conventional farming	<ul style="list-style-type: none"> - diversifying products for export - increased tourism and demand 	<ul style="list-style-type: none"> - strict environmental demands - competition from mainland/abroad
<i>Greenhouse production</i>	<ul style="list-style-type: none"> - input (labour, water) saving techniques - plastic cover with longer life span 	<ul style="list-style-type: none"> - decline in soil fertility - tighter regulations of water use and waste disposal (plastics)
<i>Animal farms</i>	<ul style="list-style-type: none"> - better access for mountain grazing 	<ul style="list-style-type: none"> - land-use restrictions, related to land conservation

Institution that support agriculture

Semi-structured interviews (SSI) and Venn-diagrams (Mikkelsen, 1995) were used to identify such institutions, and to assess their relationships and importance. The local institutions related to agriculture in general and organic farming in particular include the Regional Office of Rural Development, the Organic Farmers' Co-operative of Messara, the Farmers' Union of Messara, the local Agricultural Input Supply Dealers, the Research Institute in Heraklion (part of the National Agricultural Research Foundation - NAGREF), the Messara Research Station (part of NAGREF), the Cretan Agri-Environmental Group (CAEG) and the Agricultural School of Messara. The study on institutional linkages and their support to farmers was appraised with a member of the Rural Development Office. The respondent described the existing links and also the desired institutional linkages of these institutions if better services were to be provided to farmers in general and organic farmers in particular. In the Venn diagram, the respondent used distance from the reference institution, in this case the Rural Development Office, to reflect closeness and size representing the importance of the institutional relationships with the Rural Development Office.

The results showed that at present, the Rural Development Office and the Agricultural Bank were the two most important institutions (Figure 6), while the Research Institute (NAGREF), Farmers' Union and Agricultural Input Dealers were identified as institutions of lesser importance. The Organic Farmers Co-operative of Pitsida Commune facilitated collective purchases of inputs, and helped in sharing common costs such as machinery and training. It also functioned mainly as a centre for processing, storage and marketing of products, and for managing the subsidies. Processing and storing tasks were made through the Farmers' Union of Messara. This Union, established in 1939, assisted the Co-operative in such areas as technical support, processing, marketing and storage; and helped solve some issues such as land tenure and fragmentation problems.

In order to develop a desired future scenario for better extension services for farmers, the study group worked on another Venn diagram with an extension officer. Figure 7 is the outcome of this exercise. The major institutions identified were the Research Institute (NAGREF) and the Farmers' Co-operative and Union. It was also suggested that the role of the Rural Development Office should be refocused as a service provider if the desired institutional framework was to become successful in enabling them to benefit fully from agricultural research and extension activities.

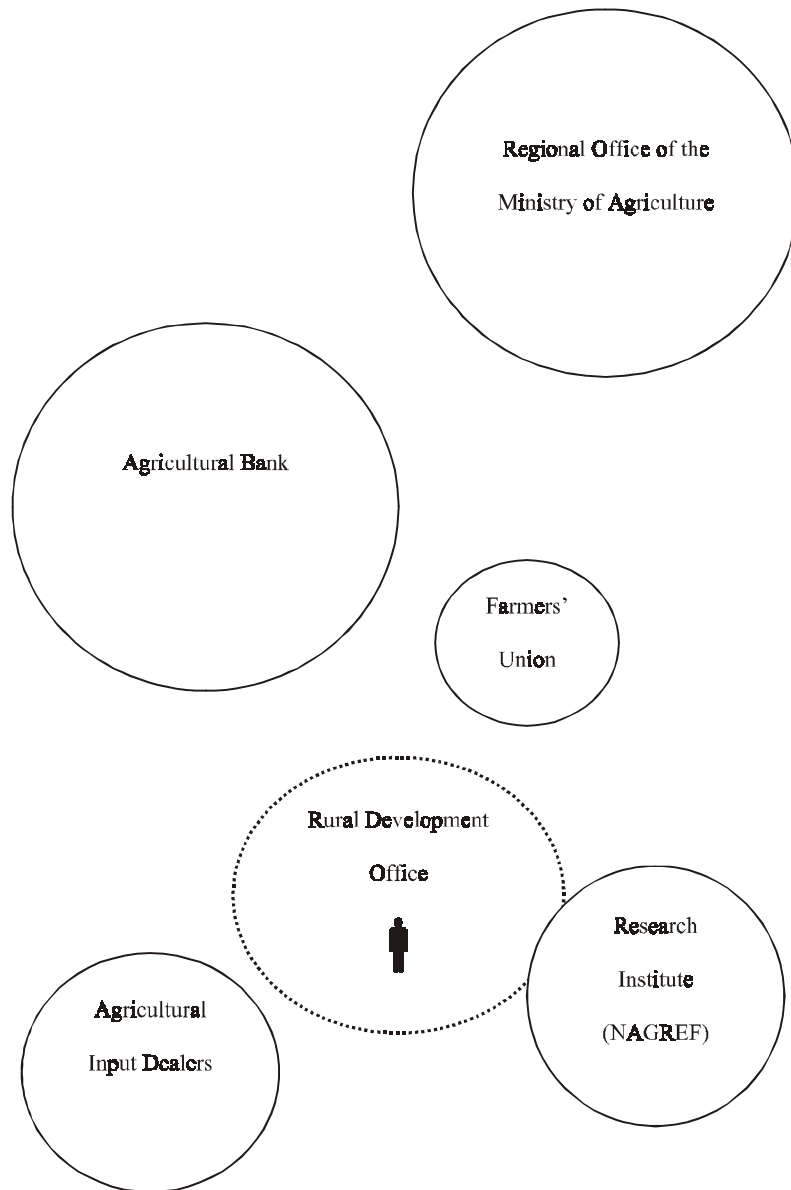


Figure 6. Institutional Venn diagram indicating current linkages and importance.

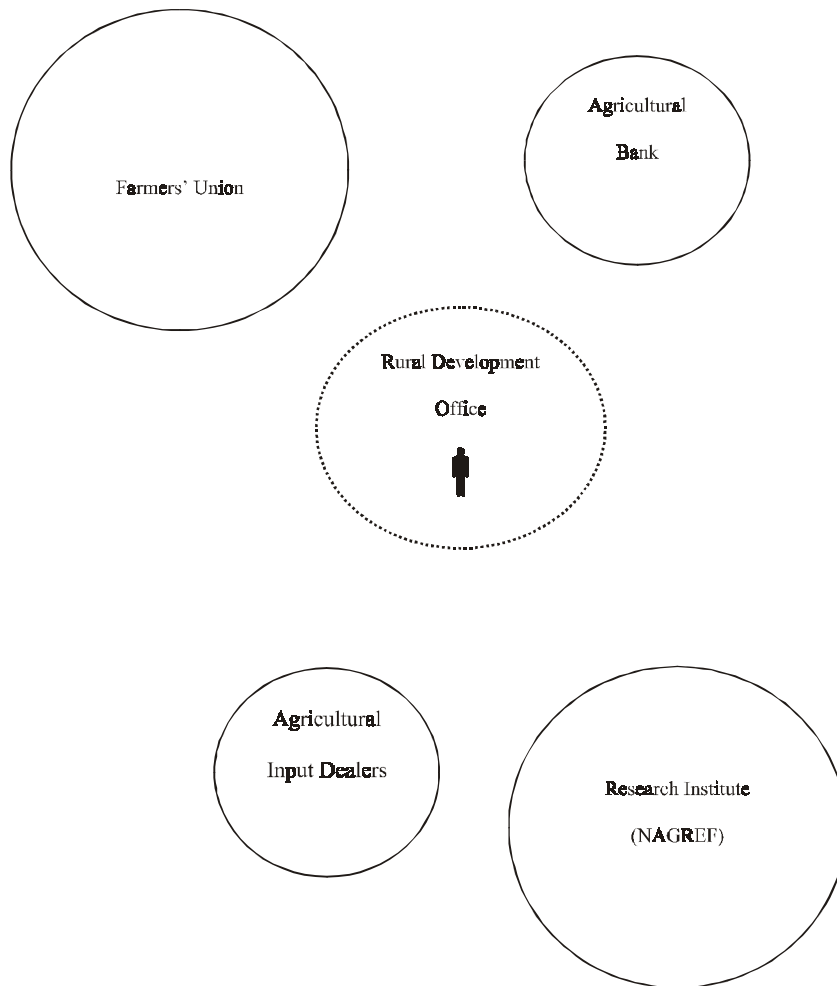


Figure 7. The desired institutional linkage and importance as suggested by an extension officer

Conclusion

From the results of this modest study, a number of observations can be drawn:

- a) Livelihood systems are changing and agriculture is evolving –The growing importance of tourism and the implementation CAP in the area, have been influencing the changes in agriculture and the livelihood system of the people. With this regard, CAP seems to be promoting only certain types of farming such as olive production. The expansion of the tourism industry also encourages farmers to grow crops that would not tie up labour during such seasons. As a result, agriculture and particularly crop production systems were increasingly tuned to accommodate spring and summer time tourist related activities. Crops where major works are undertaken during late summer, fall and winter times, such as grapes and olives, were becoming dominant production systems. The integration of farming activities with the service sector has been facilitated further by the use existing extended family links. By so doing, farmers diversify their livelihood systems, and utilise available resources such as labour, more effectively, and thereby increase value added to their farm products.
- b) Views on organic farming vary. Organic farming in Crete is not yet widespread, only a few farmers were currently engaged in producing mainly organic olive and grapes. Organic farmers and those engaged in conventional farming varied widely in their views about organic farming and its future in the study area. Conventional farmers did not think that organic farming would be a feasible option given poor fertility of soils and the prevalence of diseases and pests. They believed that as the supply of organic products increased, the present high prices for organic products would fall. Organic farmers on the other hand were convinced that it was time to change the ways of farming in order to protect the environment and produce healthy food. They have confidence in the growing demand for organic products in Europe and America, and believe that organic farming stands a better chance than conventional farming. Crete's exceptionally mild Mediterranean climate is very well suited for a wide range of both temperate and sub-tropical horticultural products. Given the climatic and location advantage of the island, the support of the European Union for safe food, and the growing demand for organic products, it is likely that the future might be brighter for organic farmers in Crete. As the organic farmers themselves said, the future of organic farming will depend on the farmers' capacity to access and maintain markets for their organic products. The fact that many of the organic farms visited had parts of their farms under conventional production, shows that they do not yet have full confidence in the organic market.
- c) Main problems are shared - Though the specific problems of conventional and organic farmers were rather different, the main problems were shared. These were problems of marketing, under development of infrastructures to timely process and transport products, and the fragmentation of land. Farmers do indeed need assistance, particularly in addressing problems related to marketing.

- d) An institutional gap is noticeable – Though several institutions were working with farmers in the study area, a significant institutional gap was noticeable. The research and extension institutions seem to be having weak working relationship with, or were in some cases not connected to, farmers in general and organic farmers in particular. The government extension services seemed to be inadequately staffed, and the office was very much occupied in implementing EU policies, consisting mainly of support and subsidies. Briefly, it appears that even though the institutional structure is put in place to support agriculture, there appears to be a functional gap in the activities of research and extension. Further studies might help to develop a more effective working relationship that would better assist farmers, particularly in overcoming the major problems that they face.

It is suggested that there is much scope for further research, both of a similar nature, and of longer term, in depth studies of change among the farmers of the Messara Plain.

Acknowledgements

Our thanks to the Department of Rural Development Studies, Swedish University of Agricultural Science for financing the study. We also extend our thanks to Dr Emmanouil Kabourakis, Mrs. Agapi Vassiliou, Dr Dimitris Papadopoulos, Mr Nikos Volakakis and Mrs Agapi Kouklinou for their facilitation during the fieldwork. We are very grateful to all farmers in the Messara Plain of Crete who generously gave us their time and shared their invaluable experiences and views.

References

- Ashley C. 2000. Applying Livelihood Approaches to Natural resource Management Initiatives: Experiences in Namibia and Kenya. Working Paper 134. ODI. London
- Ashley C. and D. Carney. 1999. Sustainable Livelihoods: Lessons From Early Experience. DFID.London.
- Binswanger,-H.P.; K, Deininger. 1997, Explaining Agricultural and Agrarian Policies in Developing Countries *Journal of Economic Literature* 35(4) 1958-2005
- Boserup, E. 1965. *The Conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure*. Chicago: Aldine Publishing.
- Carney, D. 1998. *Livelihoods Approaches Compared. A Brief Comparison of the Livelihoods approaches of DFID, CARE, Oxfam and UNDP*. DFID. London.
- Chambers R., and G. Conway. 1992. *Sustainable rural livelihoods: practical concepts for the 21st century*. IDS Discussion Paper 296. IDS, University of Sussex, UK Department for International Development

- (DFID). 1999. Sustainable Livelihoods Guidance Sheets. DFID. London.
- Hayami, Y and V. W. Ruttan. *Agricultural Development: An International Perspective*. Johns Hopkins University Press, Baltimore, Maryland, 1985.
- Kabourakis E., 1996. Prototyping and Dissemination of Ecological Olive Production Systems. A Methodology for Designing and Dissemination of Prototype Ecological Olive Production Systems (EOPS) in Crete. PhD. Thesis. Landbouw Universiteit, Wageningen, The Netherlands.
- Lele, U. and S.W. Stone. 1989. Population Pressure, the Environment and Agricultural Intensification: Variations on the Boserup Hypothesis. The World Bank, Washington, D.C.
- McIntire, J., D. Bourzat and P. Pingali. 1992. Crop Livestock Interaction in Sub Saharan Africa. World Bank. Washington, D.C.
- Mikkelsen, B., 1995. *Methods for Development Work and Research: A Guide for Practitioners*. Sage Publications, New Delhi/Thousand Oaks/London.
- Nigali, U. 1999. Holistic Approaches in Organic Farming Research and Development: A General Overview. In: Zanoli, R. and R. Krell (eds.). *Research Methodologies in Organic Farming*. REU Technical Series 58. FAO. Rome
- OFRF (Organic Farming Research Foundation). 2001. Information Bulletin. Summer 2001 URL Address <http://www.ofrf.org/>. Accessed October 2001.
- Pingali, P.L., Y. Bigot and H. Binswanger. 1987. *Agricultural Mechanisation and the Evolution of Farming Systems in Sub Saharan Africa*. World Bank in association with John Hopkins University Press. Baltimore.
- Statistical Yearbook of Greece, 1999. National Statistical Service of Greece, Athens
- URL Address. <http://www.interkriti.org/intro.html>. Accessed April 1999.
- URL Address <http://www.interkriti.org/visits/pitsidia.html>. Accessed April 1999.