EUROPEAN UNION AGRO-ENVIRONMENTAL POLICY IMPACT FOR AGRICULTURAL LANDSCAPE CONSERVATION: THE CASE OF LEMON CULTIVATION IN NORTH-EASTERN SICILY

JEL classification: Q18

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Abstract. *This study analyses the effectiveness of the agro-environmental policies of the European Union for North-Eastern Sicily (Messina Province) where lemons have been harvested on terraces for hundreds of years. Since the latter years of the 1980s, there has been a gradual decline due to a drop in the value of lemons, an increase in labour costs and in non-agricultural use of land. Abandonment of farms has gradually brought about a deterioration in the agricultural landscape and given rise to erosion, due, principally, to the destruction of dry stone walls. The analysis is based on GIS photo-interpretations of the variations in cultivated areas and the consequent mutations of the agricultural landscape in a sub-area of Messina Province which was the subject of similar analysis in 1963. The results have highlighted that in the study area there has been a drastic reduction in the area under lemon cultivation. This continuing decline is likely to be difficult to reverse in the coming years because of negative average farm incomes. This negative trend in profitability has occurred despite the many legislative incentives for lemon farms. The results seem to suggest a revision of current strategies to protect agricultural landscape especially in the marginal rural areas of the European Union.*

Key words: *Landscape, CAP, AES, Sicily, Lemon*

1. Introduction

The evolution of the economics underlying the principles of globalisation has led to a slow but inexorable decrease in farm incomes. The most badly affected have been the micro and/or small farms which have difficulty competing in an ever-increasingly competitive system. Above all in sensitive areas, all these issues have aggravated the 'abandonment' phenomenon with the consequent deterioration of the environment and a loss of biodiversity (Coppola, Verneau, 1998; Knowler and Bradshaw 2007; Dallimer et al. 2009; Stoate et al. 2009).

In order to counter this situation, European policy for rural development has attributed growing importance to preserving rural areas and environment, above all in marginal areas at high hydro-geological risk (D'Amico, Sturiale L., 2001; La Via, D'Amico, 2008). Many studies have analysed and evaluated the benefits that the preservation of agricultural landscape can generate for a society which is becoming more demanding in terms of quality of life and protection of the environment (Fleischer, Tsur, 2000; Marangon, Tempesta 2001; Signorello *et al.*, 2006; Tempesta, 2006; Scarpa *et al.*, 2009).

The Common Agricultural Policy (CAP) which has been divested of its original protectionist components now favours a more multifunctional orientation to support farms which take on eco-compatible activities (Vieri, 2011). Numerous studies have analysed the impact of such policies both on farm incomes and in terms of land conservation and environmental protection (Hanley et al. 2007; Tranter et al. 2007; Acs et al. 2010; Bougherara and Latruffe 2010).

In the context of EU agricultural policies, agro-environmental protection is carried out via the two pillars of the CAP. The first of these, Single Farm Payments, introduced by EU regulation 1782/2003, offers financial support unrelated to production and allocated only if certain minimum norms for environmental welfare are maintained. Through policies for rural development (2nd CAP pillar), the EU has introduced other types of financial support which provide for farmers' voluntary participation in agri-environmental programs for conserving the environment, biodiversity, farm landscapes and organic produce. Agri-environmental policies are implemented within Rural Development Programmes (RDP) through 'Agri-Environment Schemes' (AES) whose aims are to conserve nature, protect the environment and manage the land.

Intense scientific debate surrounds these AESs to investigate their effectiveness in rural areas especially as regards marginal farms which are more likely to be abandoned, the consequent risks of hydro-geological instability and the loss of biodiversity (Concepcion *et al.*, 2008; Finn *et al.* 2009; Primdahl *et al.* 2010). Numerous studies have analysed the efficacy of such instruments by referring to various aspects linked to agri-environmental conservation such as the impact on conservation of biodiversity (Whittingham 2007; Turpin et al. 2009), traditional and quality farm produce (Aubry et al. 2005; Quetier, 2005) and protection of land against the risks of hydro geological instability (Hopkins and Holz 2006; Caballero and Fernandez-Santos 2009). However, the success of AESs depends on the effective participation of farmers who decide to volunteer according to numerous variables such as the economic and structural characteristics of farms (size and income), the farmer's qualifications and others (Toma and Mathijs 2007; Yiridoe et al. 2010).

With these in mind, this study analyses the efficiency of the agri-environmental policies in North-Eastern Sicily (Messina Province) where lemons have been harvested on terraces for hundreds of years, characterising, at the same time, the landscape of the Province of Messina both aesthetically and visually. In the past, this crop made a significant financial contribution as compared with others. Since the latter years of the 1980s, there has been a gradual decline due to a drop in the value of lemons, an increase in labour costs and in non-agricultural land use (Sturiale 1964; Sturiale, Pulvirenti 1981; Bucca 2006).

The abandonment of lemon farms has gradually brought about a deterioration in the agricultural landscape and given rise to erosion due, principally, to the destruction of dry stone walls (D'Amico 2011). The analysis is based on GIS photo-interpretations of the variations in cultivated area and the consequent mutation of the agricultural landscape in a sub-area of Messina Province which was the subject of similar analysis in 1963 (Sturiale 1964). The results can be referred to the entire area of the Lower Ionia Sea (Messina Province), in which the abandonment of the countryside has been the main cause of the recent natural disasters at Giampilieri and Scaletta Zanclea in 2009.

2. Normative context

Agri-Environment Schemes were introduced into Europe for the first time in Germany in 1985 as an agri-environmental policy independent of CAP, providing financial support for farmers who adopted practices which respected the agricultural environment.

EEC Regulation 2078/92 meant that AESs became accompaniments to the CAP Reform (1992), being adopted by all 12 member states. Due to their success, Austria, Finland and Sweden began applying them prior to their official EU entry (De Putter 1995; Deblitz and Plankl 1998; Buller 2000).

Subsequently, AESs became an integral part of Common Agricultural Policy for rural development first through EU Regulation 1257/99 and then through EU Reg. 1698/2005 which is current for the 2007-2013 CAP.

The main objective of AESs is to incentivate farmers to adopt agro-ecocompatible practises. In return they receive a financial reward to pay for the environmental services supplied to the community. Since the application of Regulation 2078/92, the adoption of such practises would, moreover, production surpluses which have often been the cause of commercial conflict between the EU and other international competitors (Scheele 1996).

Within the EU's rural development policy, AESs are based on the principle of subsidiarity and consequently are applied through specific agro-environmental programs. Some of these are applied on a vast scale, involving the entire agricultural area (AAU) of a region or state. In other cases AESs refer to specific areas with particular agro-environmental characteristics and as a consequence they are applied on a reduced scale. This is the case for '*Environmentally Sensitive Areas'* or more recently 'Stewardship Schemes' which are widely used in the United Kingdom and which, by means of the active involvement of local players and with simple transparent access rules, are applied to specific agricultural areas, with positive effects for conserving the agro-environment and rural areas (Hodge and Reader 2010; Nomura et al. 2010).

AESs must be subscribed to through a contract between farmers and the public administration in return for producing positive external effects with financial support to compensate for any additional costs, including any loss of earnings due to the application of agro-environmental measures.

Currently, measures for improving the environment and countryside (EC Regulation 1698/2005) are covered by Axis 2 of the Rural Development Programme (RDP). The objectives of this Axis are to conserve biodiversity, to safeguard agricultural systems with high naturalistic value, to protect water resources, to reduce greenhouse gasses and protect the countryside. These objectives are applied through numerous measures reported in *table 1*:

Tab. 1 - Financial Plan - programming period 2007-2013

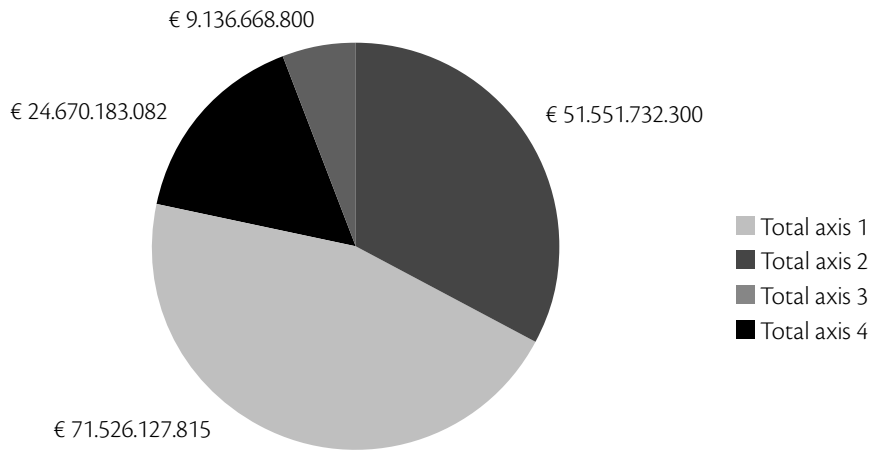
Measure		Total public expenditure	
		€	%
211	Natural handicap payments to farmers in mountain areas	10.825.867.962,99	15,1
212	Payments to farmers in areas other than mountain	11.858.853.270,21	16,6
213	Natura 2000 payments and payments linked to Directive 2000/60/EC	785.802.849,38	1,1
214	Agro-environmental payments	37.627.303.892,76	52,6
215	Animal welfare payments	1.022.874.226,61	1,4
216	Non-productive investments	1.087.687.082,31	1,5
221	First afforestation of agricultural land	3.410.115.308,95	4,8
222	First establishment of agroforestry systems	24.874.721,13	0,0
223	First afforestation of non-agricultural land	539.473.502,00	0,8
224	Natura 2000 payments	143.243.845,92	0,2
225	Forest-environment payments	415.723.572,68	0,6
226	Restoring forestry potential and introducing prevention	2.478.136.793,98	3,5
227	Non-productive investments	1.306.170.785,96	1,8
	TOTAL	**71.526.127.814,89**	**100,0**

Source: European Commission

The financial plan for the various measures in Axis 2 highlights that over 50% of resources goes to Measure 214 relating to Agri-Environment Payments, followed by Measures 212 and 211 relating to compensation for farmers in marginal areas and Natural Handicap Payments.

Overall, the Axis 2 Measures of the RDP amount to over €71M making it the most important Axis in financial terms over the period 2007 – 2013 (*graph 1*).

Graph 1 - Relative importance of axes within total public expenditure for the programming period 2007-2013 - EU27



Source: European Commission

On the whole, the measures for safeguarding the environment and rural areas have been activated right across the EU with a few differences depending on the economic and environmental characteristics of individual countries. *Table 2* shows a summary of the regional spread of measures of Axis 2 for 2007 – 2013 (EU 27).

As may be seen, that most widely adopted amongst the EU Member States is Measure 214 'Agri-Environment Payments'. The main objectives of this measure are to incentivate agri-eco-compatible practises aimed at producing organic products, safeguarding rural areas, especially in marginal areas at greater risk of hydro-geological instability, and conserving biodiversity. Farmers voluntarily subscribing to Measure 214 receive a financial reward for quality services to the community.

Another measure which has been implemented right across the EU is 212 '*Payments to farmers in areas with handicaps, other than mountain areas'* through which farmers in marginal areas and those with natural disadvantages receive financial support. The farmers' award is aimed at providing incentives not to abandon their farms but to keep them running.

Tab. 2 - Regional spread of measures of Axis 2 in the European Union programming period 2007-2013

Country	211	212	213	214	215	216	221	222	223	224	225	226	227	TOTAL
	Natural handicap payments to farmers in mountain areas	Payments to farmers in areas with h., other than mountain areas	Natura 2000 payments and payments linked to Directive 2000/60/EC	Agri-environment payments	Animal welfare payments	Non-productive investments	First afforestation of agricultural land	First establishment of agroforestry systems	First afforestation of non-agricultural land	Natura 2000 payments	Forest-environment payments	Restoring forestry potential and introducing prevention	Non-productive investments	
Belgium		√	√	√		√	√	√					√	7
Bulgaria	√	√		√					√			√		5
Czech Republic	√	√	√	√			√			√	√	√	√	9
Denmark		√		√		√	√				√	√	√	7
Germany	√	√	√	√	√	√	√		√	√	√	√	√	12
Estonia		√	√	√	√	√	√			√				7
Ireland		√	√	√										3
Greece	√	√	√	√		√	√		√	√		√	√	10
Spain	√	√	√	√	√	√	√	√	√		√	√	√	12
France	√	√		√		√	√	√	√		√	√	√	10
Italy	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**√**	**13**
Cyprus	√	√		√			√	√	√		√	√	√	9
Latvia		√	√	√					√	√		√		6
Lithuania		√	√	√			√		√	√	√	√	√	9
Luxembourg		√		√							√		√	4
Hungary		√	√	√	√	√	√	√	√		√	√	√	11
Malta		√		√										2
Netherlands		√		√		√	√							4
Austria	√	√	√	√	√		√			√	√	√		9
Poland		√		√			√					√		4
Portugal	√	√	√	√		√	√	√	√	√	√	√	√	12
Romania	√	√		√			√							4
Slovenia	√	√		√										3
Slovakia	√	√	√	√	√		√			√	√	√		9
Finland	√	√		√	√	√	√							6
Sweden		√		√		√							√	4
United Kingdom		√		√	√	√	√		√		√		√	8
TOTAL	**14**	**27**	**14**	**27**	**9**	**14**	**20**	**7**	**12**	**10**	**14**	**16**	**15**	**199**
Index of national spread (%)	51,9	100,0	51,9	100,0	33,3	51,9	74,1	25,9	44,4	37,0	51,9	59,3	55,6	

Source: European Commission

3. Methodology

This work was inspired by previous research into Sicily's Lower Ionean Sea (Messina Province) in the mid 1960s (Sturiale, 1964). To be able to compare the data, this work studied exactly the same area, covering 1,040 hectares, located in Messina Province and including the villages of S. Teresa di Riva, Savoca, Furci Siculo and S. Alessio Siculo (*figures 1 & 2*).

Fig. 1 - Research area - 1964 map

Location of the area under lemons on the southern Ionic coast of the Messina area

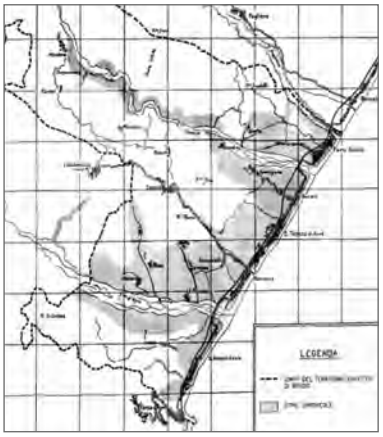
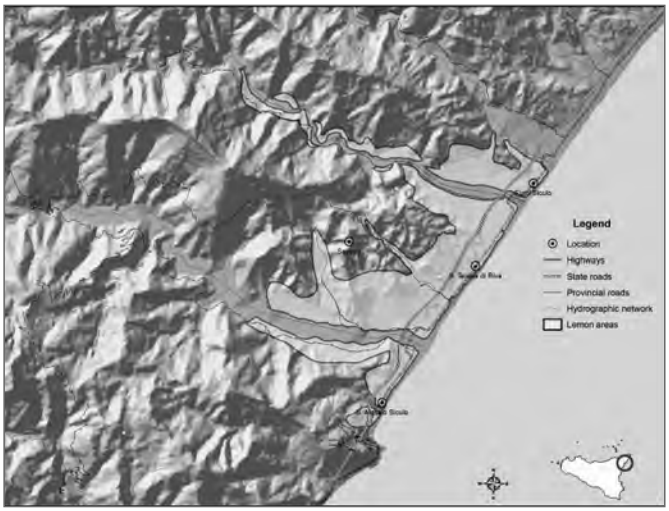


Fig. 2 - Research area - GIS map



Starting off with Sturiale's analysis, we compared the extent of lemon groves in the 60s with that of today. The analyses were carried out by a detailed study of photointerpretive techniques[1]. Digital orthophoto mapping was used which has the great advantage of being adaptable to horizontal projection[2]. Furthermore, orthophotos can easily zoom in on details or zoom out for an overview thus drastically saving time (Chirici, 2005) and significantly increasing the reliability of interpretation[3].

Orthophoto mapping was applied to three different data levels: observational, visible spectrum and degree of detail as follows:

– colour digital orthophotos from flight ATA2008 of Gauss-Boaga Fuso EST coordinates (nominal scale 1:10.000, resolution 25cm/pixel) available at http://www.sitr.regione.sicilia.it (SITR: regional data system).
– colour digital orthophotos IT2000 of Gauss-Boaga Fuso EST coordinates (nominal scale 1:10.000, land resolution less that 1 metre) (SITR);
– Black and white orthophotos 1994 (nominal scale 1:25.000) available at http://wms.pcn.minambiente.it (Ministry for the Environment).

Apart from orthophotos, numerous other geographical references were used:

– Regional Technical Map (raster) 1:10.000;
– IGM map (raster) 1:50.000
– Regional Technical Map of Administrative Borders;
– Hydrographic Network within the Welfare Plan for Regional Sicilian Waters;
– Tele Atlas roadmap;

[1] Photointerpretation is an investigative tool which makes it possible to extract data from aerial photographs (Guidi, 1978). They are based on spectral and geographic parameters (tone & colour, shape, size, shade and shadow, texture, structure and associated particulars) and develop over the subsequent phases of characterisation, identification, classification and deduction. This information is then managed by a GIS (Geographical Information System (Burrough, 1986).

[2] This property enables the videoing of orthophotos at one scale and the superimposing of other data types on the same mapping system (Ioannilli, Schiavoni, 2002).

[3] The GIS surveys were run with ESRI ArcMap 9.2 and projected in Gauss-Boaga/UTM East Zone.

– DEM (*Digital Elevation Model*) Sicilia, 20m x 20m base units.

These supports proved useful not only for the photointerpretive phase but even more so for helping produce the final maps.

The colour orthophotos can be videoed up to a scale of 1:2.000 maintaining optimum geometrical and spectral resolution. An expert photointerpreter can also easily distinguish many land and plant details in them. Usually, shadow is limited and so most details can be easily classified (Amadesi, 1975). Furthermore, shots taken at different times can highlight changes in land use and clarify any shaded areas (shadows, imperfect image etc.) in any one of the photographic supports.

The main evaluation parameters were:

– photo weaving (microscopic changes in colour tone);
– structure (microscopic changes in colour tone);
– general context.

The next phase of attributing thematic classes was carried out visually by the photointerpreter (traditional or manual type) (Lillesand, Kiefer, 2003; Franklin, 2001)[4]. Furthermore, to reduce the bulk of work needed to analyse all the objects, given the small segmentation scale, an automatic classification estimate was carried out, followed by a dissolve phase to eliminate adjacent polygon borders (ESRI, 2006).

4. Results

The original research (Sturiale, 1964), upon which this research is based, facilitated analysis of how the lemon crop evolved in the area from 1963 to 2010.

Orthophoto analysis helped define, identify and summarise six class types reported on maps which represent the 2008 status of the lemon crop:

1. Productive lemon orchards (regular orchard set-up, intense green trees etc.);
2. Abandoned lemon orchards (irregular orchard set-up, crown is no longer globe-shaped and varies in size etc.);
3. Abandoned lemon orchards which are partially renaturalised (visible co-existence with other trees and shrubs etc.);
4. Abandoned areas which were orchards in the past (mostly nude areas where only a few signs of the orchard remain etc.);
5. Urbanised areas;
6. Other areas (everything not described above).

Having identified the class types, the next step was to verify the productive lemon orchard surface area (*table 3*) and map it. In total it amounted to 107 hectares, 10,3% of the area identified in the 60s. As regards the other classes, the photointerpretive analysis of the area identified 223 ha of 'abandoned lemon orchards' (21,5% of the total), 223 ha of 'partially renaturalised lemon orchards' (21,5%), 77 ha (7,4%) of past orchards, 213 ha of urbanised areas (20,5%) and 197 ha (18,9%) in class 6.

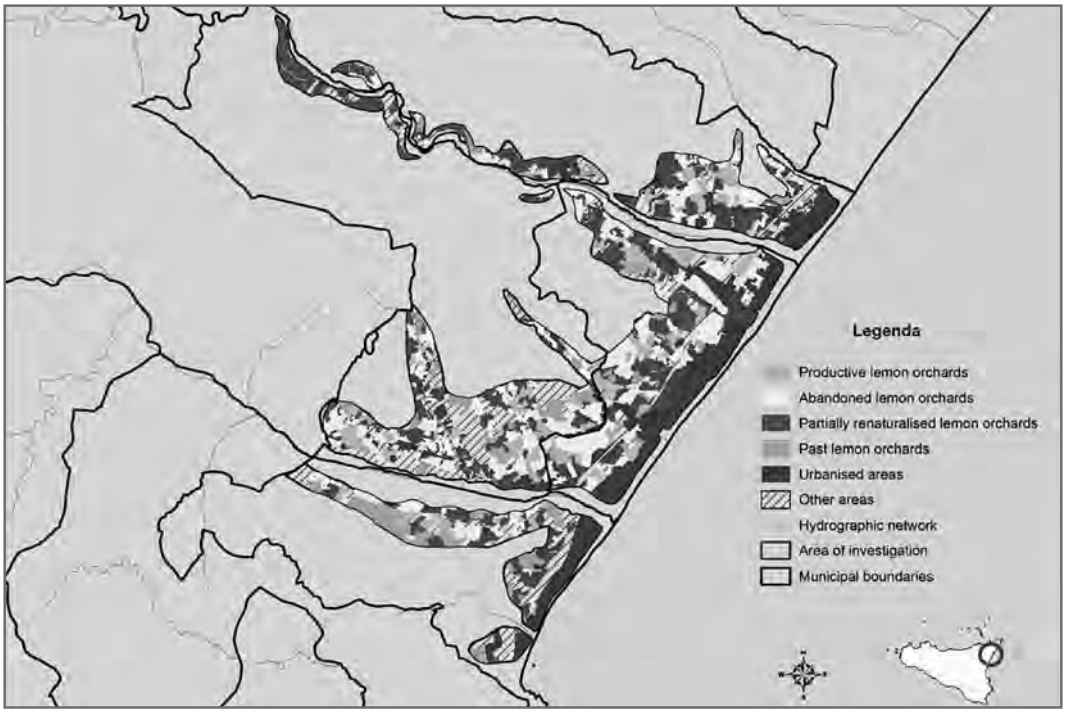
[4] Thematic classes can be attributed either manually or semi-automatically. Nevertheless, the accuracy of certain classification algorithms is still not up to direct use.

Tab. 3 - Class break-down of surface areas		
	Surface areas	
	hectares	%
Productive lemon orchards	107	10,3
Abandoned lemon orchards	223	21,5
Partially renaturalised lemon orchards	223	21,4
Past lemon orchards	77	7,4
Urbanised areas	213	20,5
Other areas	197	18,9
TOTAL	**1.040**	**100,0**

Source: European Commission

The results of the photointerpretive analysis and locations of the class types is shown in *figure 3*. These results highlight a highly critical situation with the gradual disappearance of lemon cultivation which is progressively replaced by returning to its natural state of spontaneous growth, (a phenomenon not necessarily positive). Moreover, the disappearance of the lemon is often due to tough competition with alternative non-agricultural land use especially urbanisation. In this way not only the hydro-geological equilibrium of territory is at risk, but also the specific characteristics of agricultural landscape suitable for lemon farming. These changes are consequently unsettling in an area where for centuries the lemon was a social, historical and cultural focal point, strongly characterising the landscape from the aesthetic and visual point of view.

Fig. 3 - Photointerpretation of the study area (2010)



5. Discussion and policy implications

The decrease in areas planted with lemon in the area under study came about despite European Regulations for the protection of the agricultural landscape (Regulations EEC 2078/92, EU 1257/99 and EU 1698/2005). In the study area, the application of these Regulations has occurred through the following programs:

– The Environmental Programme (EEC Regulation 2078/92).
– The Rural Development Programme for Sicily 2000-2006 (EU Regulation 1257/99).
– The Rural Development Programme for Sicily 2007-2013 (EU Regulation 1698/2005).

Below we chart the various Measures of the Rural Development Programmes for protecting rural areas and the agri-environment that have been applied or are ongoing in the study area (*table 4*).

Tab. 4 - Main measures for protecting rural areas and the agri-environment applied in the Messina Province

Program	Measure	Action	Financial support	Minimum farm surface (ha)
Environmental Programme: Reg. 2078/92	A1 - Pesticide reduction		603 ecu/ha	1 ha
	A2 - Organic agriculture		1208 ecu/ha	1 ha
Sicilian Rural Development Programme 2000-2006	F - Agri-environment	F1a - Organic production methods	600 €/ha	1 ha
		F1b - Organic agriculture and animal husbandry	850-900 €/ha	1 ha
		F3 - Landscape restoration and maintenance	600 €/ha	1 ha
Sicilian Rural Development Programme 2007-2013	214 - Agri-environment payments	214/1A - Eco-sustainable farm management	450 €/ha	2 ha
		214/1B - Organic agriculture and animal husbandry	750-800 €/ha	2 ha

Source: RDP of Sicily

As highlighted, over the last twenty years rural development policies activated in the EU have attributed great importance to conservation of agricultural landscape in the rural areas.

Nevertheless, analysing the evolution of the surface area dedicated to lemon cultivation, there has been a drastic reduction over the last 50 years, of 82% (*table 5*). Particularly over the past

Tab. 5 - Breakdown of the area dedicated to lemon cultivation in the study area

Villages	1963 (*)		1980 (**)		2000 (**)		2010	
	hectares	% change	hectares	% change	hectares	% change	hectares	% change
S. Teresa Riva	250	100	139	-44	58	-77	44	-82
Savoca	140	100	163	16	123	-12	32	-77
Furci Siculo	120	100	384	220	88	-27	18	-85
S. Alessio Siculo	90	100	85	-6	61	-32	13	-86
TOTAL	**600**	**100**	**771**	**29**	**330**	**-45**	**107**	**-82**

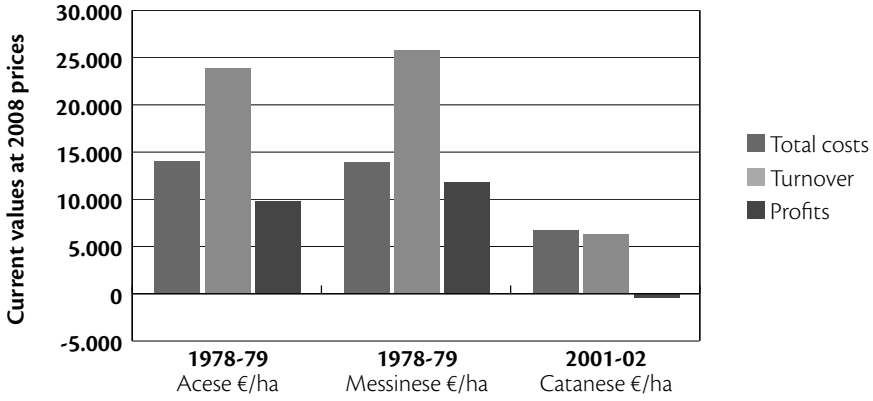
(*) Sturiale C, 1964
(**) ISTAT - III & V General Census of Agriculture

decade, despite the implementation of the RDP, the lemon area cultivated in the villages of the study area has decreased from 330 to 107 ha.

The reasons behind this collapse are mostly attributable to reduction of RDP measures applied in the study area for safeguarding the lemon landscape. Currently only the Measure 214 "Agri-environment payments" is applied, with financial support of 450 €/ha (Action 214/A) and 750-800 €/ha (Action 214/B). No other measure of RDP has been applied or is on going in the study area for lemon landscape conservation. Furthermore, to qualify for benefits from the RDP, the minimum area of the farm holdings currently is 2 ha more than in the past, when the minimum surface was 1 ha.

In the last thirty years there has also been a collapse in income for lemon growers. So, looking again at the figures of previous Sicilian economic research regarding the incomes of lemon farms[5] and converting the results into 2008 prices: profits fell from 11.824,82 euro/ha in 1978 to –467,84 euro/ha in 2008 (*graph 2*).

Graph 2 - Trend in profits of lemon farms in Sicily over the last thirty years



Source: our calculations on data from the Annuario statistico italiano, 2009; Tavola 22.12.
Source: Sturiale, Pulvirenti 1981; Bucca 2006

These economic results show clearly that despite the significant potential in terms of policy support, lemon cultivation in the study area seems to be irredeemable in landscape and environmental terms. The total lack of any income from lemon farming around Messina has caused an irremediable reduction in the surface areas cultivated.

The results of the study can be extrapolated to the entire area of North-Eastern Sicily (Messina Province). In this area, the total surface dedicated to lemon cultivation in 2000 was 3.844,73 hectares. If we compare the Utilised Agricultural Area (UAA) between 2000 and 1980, we note a significant decline (-44,92 %)[6] due to the decrease in income for lemon growers and the scarce effectiveness of agri-environmental Measures (*table 6*).

[5] Sturiale, Pulvirenti, 1981, Bucca, 2008.

[6] The official data of the 6th Agricultural Census (2010) are not yet available, but it is easy to predict further decline of the area planted with lemon due to the current economic crisis that is affecting the entire agricultural sector.

Tab. 6 - Class break-down of the surface area dedicated to lemon cultivation in Messina Province

Year (*)	surface area dedicated to lemon cultivation								Total	
	< 1		1 - 2		2 - 5		> 5			
	ha	%	ha	%	ha	%	ha	%	ha	%
1980	1.335,64	19,1	964,84	13,8	1.384,26	19,8	3.295,10	47,2	6.979,84	100,0
2000	1.143,63	29,7	575,99	15,0	727,60	18,9	1.397,51	36,3	3.844,73	100,0
Var. % (2000 / 1980)	**-14,38**		**-40,30**		**-47,44**		**-57,59**		**-44,92**	

(*) ISTAT - III & V General Census of Agriculture

If, moreover, we observe the class break down of the lemon holdings in Messina Province in the same period (1980-2000) we can note that the number of lemon holdings fell (-22%). Furthermore, in 2000 about 80% of lemon holdings were less than 2 hectares and consequently could not qualify for benefits from the RDP (*table 7*).

Tab. 7 - Class break-down of the lemon holdings in Messina Province

Year (*)	number of lemon holdings								Total	
	< 1 ha		1 - 2 ha		2 - 5 ha		> 5 ha			
	ha	%	ha	%	ha	%	ha	%	ha	%
1980	7.213	61,1	2.085	17,6	1.524	12,9	992	8,4	11.814	100,0
2000	5.370	58,3	1.937	21,0	1.241	13,5	665	7,2	9.213	100,0
Var. % (2000 / 1980)	**-25,6**		**-7,1**		**-18,6**		**-33,0**		**-22,0**	

(*) ISTAT - III & V General Census of Agriculture

6. Conclusions

Lemon growing in Sicily takes up a considerable amount of agricultural land along the coast and is closely linked with the landscape imagery of non-residents. Nevertheless, the last fifty years has seen a progressive decline in lemon growing which has led to the disappearance of most lemon farms and a huge reduction in the surface area cultivated. This has happened despite the EU's agri-environmental policy which, in the last twenty years, has tried to reverse this negative trend through numerous measures which are potentially applicable to the lemon holdings in the Messina area.

The results of the study inspired by previous research (Sturiale, 1964), have, through photointerpretation, shown that in the study area there has been a drastic reduction in the area under lemon farming, which is currently about 107ha as opposed to the 600ha of 1963.

A negative trend in profits has occurred despite the many legislative incentives for lemon farms (Regulations 2078/92, 1257/2003, 1698/2005).

At the same time in the entire area of North-Eastern Sicily in Messina Province, where lemons have been harvested on terraces for hundreds of years, the area of lemon cultivation and the number of lemon holdings have decreased dramatically, by -44,92% and -22% respectively. This ongoing regression is likely to be difficult to reverse in the coming years because of low average farm incomes (€-468/ha).

The reasons behind such a 'failure' may be found in the economic size unit (ESU) of lemon farms which generally is smaller than the minimum surface necessary to access benefits from the RDP measures. Currently, at least 80% of lemon holdings in Messina Province cannot qualify for benefits from the RDP.

At present there is no project for rural areas, encompassing the economic, social and environmental issues, which envisage an overall strategy for the agricultural landscape, dovetailed with territorial planning. For this reason the results seem to suggest a revision of current strategies and measures, perhaps referring to other models such as for example, collective action for stipulation of agreements between farmers or strengthening the role of local partnership (e.g. Local Action Group as in the Axis 4 of RDP - Leader Approach). Furthermore, less restrictive conditions for access to agri-environmental Measures (e.g. minimum farm surface) can help to safeguard lemon landscape conservation.

Nonetheless, the question remains open as to whether society would benefit from conserving the lemon orchard landscape around Messina, since every conservation policy has a cost to society (Cicia, D'Amico, Pappalardo 2010). In this regard, the 'Safe Minimum Standard' (SMS) (Ciriacy-Wantrup 1952) approach is to conserve the farm landscape with specific initiatives as long as they are socially acceptable (Bishop, 1978). From this viewpoint, defining new models for governing the territory would seem laudable and might contribute to restoring and conserving the lemon farms around Messina which today seem irremediably destined to a rapid and irreversible decline from a landscape, economic and social points of view.

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