AGROFORESTATION AND LEVEL OF INCOME IN ITALIAN RURAL AREAS: AN ANALYSIS OF MULTIFUCTIONALITY IN RURAL DEVELOPMENT PLAN

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Introduction

During the time the role of primary sector is completely changed due to a different role and function of the countryside ascribed by people to protect the environment and to get better socio-economic living conditions.

The second pillar of Common Agricultural Policy has defined some principles to improve the rural development through the multifunctionality, that implies for farmers to plan and put into practice different activities to protect the rural space both in environmental terms and also in socio-economic terms, with the consequence to increase the sense of belonging to rural community and not to be excluded by processes of local governance.

In particular, the agroforestation, by different actions put into place since the 1990s by the European Union, has produced positive impacts on the transition from an agrarian productivist model to a post-productivist one, reducing the effects of an overproduction and to change the landscape in some Italian farms, where it is possible to find many arboreous cultivations.

Aim of the paper

In poor areas agricultural naturals resources and the environmental protection are the most important factors to produce a fair level of income and a socio-economic sustainability, thus the forestation might be a positive tool to reduce the poverty in rural areas with the consequence to support a partial justification of allocation of government interventions, in terms of funds and subsides, by the European Union.

The aim of this research was to analyze, using a quantitative approach by a regression model, the main and foremost interrelationships among the dependent variable general living conditions in the countryside, in terms of income of farmers, and the independent variables such as amount of subsides paid by the European Union to improve afforestation actions in rural areas and foretasted surfaces.

Methodology

To estimate the parameters and the different interrelationships among variables it has used a quantitative approach and by a model of multiple regression in which it has been included and estimated all the analysed variables, through the Ordinary Least Square (OLS), it has been possible to value the main interactions. In analytical terms, the model of multiple regression in its general formulation can be made explicit in this way:

$$\ln y = \alpha_0 + \alpha x_1 + \beta x_2 + \ln\gamma\, x_3 + \varepsilon_{jt}$$

α_0 constant term
ln y stands for farms' income (IPS)
x_1 is afforestated surfaces (AS)
x_2 stands for labour force in the primary sector (WPS)
ln x_3 is funds allocated by Rural Development Plan to promote agroforestry actions (RDPA)
α,β,γ estimated indicators of the model
ε_{jt} term of statistic error.

Results and discussion

During the time of observation, from 2000 to 2010, the statistical data of Italian Agricultural Census made by Istat, it was possible to observe a decrease both in cultivated surfaces (*Graph. 1*) and also in number of farmers.

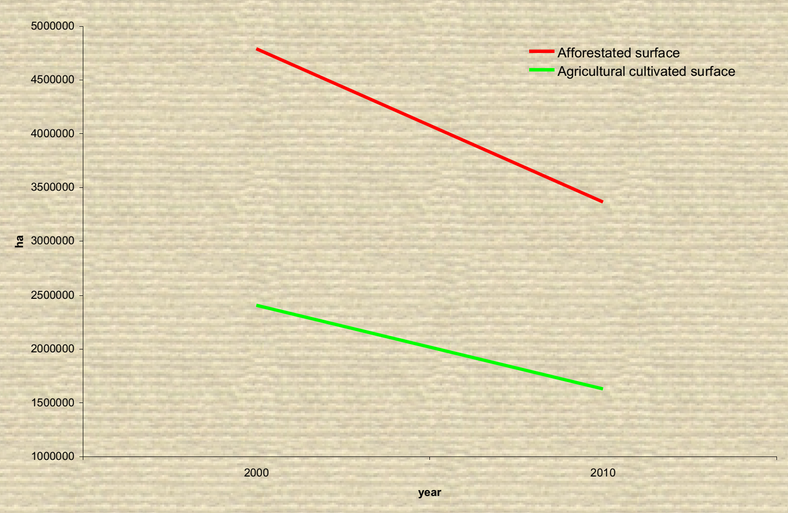
Over the time of observation three Italian regions only have enhanced the afforestated surfaced and two of these are located in the north of Italy where there is a significant percentage of area covered by forests (*Graph. 2*).

The multiple regression model, during the Agenda 2000 time, has pointed out a direct correlation among the independent variables afforestated surface, workforce in the primary sector and public funds allocated by the European Union to improve the forestation actions through the Rural Development Plan and the dependent variable level of income in the rural areas (*Tab. 2*).

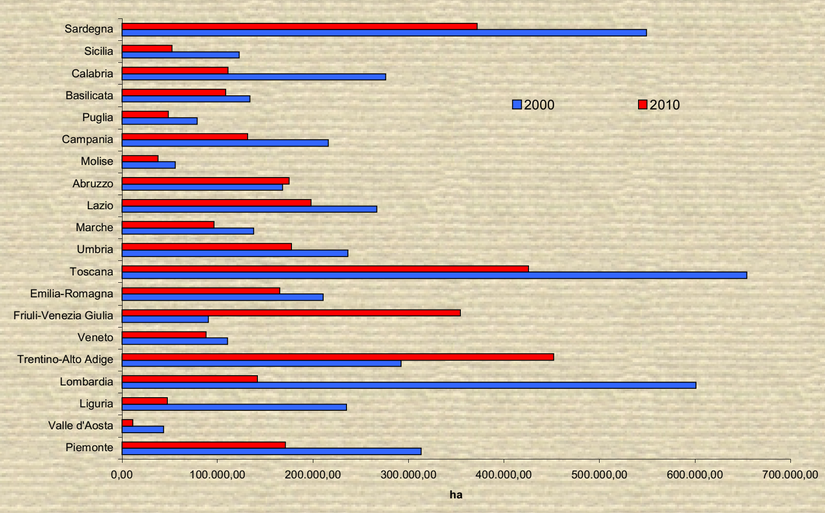
The multiple regression model, during the Rural Development Plan 2007-2013 time, has underlined a direct correlation among the independent variables afforestated surface and workforce in the primary sector and the dependent variable level of income in agriculture, instead the multiple regression model has showed as the independent variable public funds allocated by the European Union to promote forestation actions did not have any effect in the quantitative model (*Tab. 3*).

Final remarks

To sum up, the agroforestation has been a positive tool to increase the pluriactivity in the primary sector and to protect rural space enhancing the level of income in rural spaces even if farmers and other stakeholders taking an active part in Italian rural development need a reduction in bureaucratic aspects to carry out easily an holistic and shared project of rural development.



Graf 1- Surface with forest (FS) and agricultural cultivated surface (AUS) in Italy *(Source: our elaboration on data www.istat.it Census of Italian Agriculture 2000 and 2010)*



Graf 2- Surface with forest in different Italian regions *(Source: our elaboration on data www.istat.it Census of Italian Agriculture 2000 and 2010)*

Tab. 1- Definition of variables used in the quantitative multiple regression model

Variable	Definition of Variable	Value/Measure	Type of variable
AS	Afforestated surface	(000) hectares	Independent
WPS	Workforce in the primary sector	(000) of workers	Independent
RDPA	Amount of funds about afforestation	(000) €	Independent
IPS	Income in the primary sector	(000) €	Dependent

Tab. 2- Main results of multiple regression model in 2000 *(Source: our elaboration on data www.istat.it Census of Italian Agriculture 2000 and 2010 and European Union www.europa.eu)*

	Coefficient	Standard error	t value	p value	Significance
Constant	6,02597	2,65402	2,2705	0,03569	**
AS	9,09917e-07	4,35335e-07	2,0902	0,05107	*
WPS	1,37922e-05	3,02844e-06	4,5542	0,00025	***
ln RDP	0,379301	0,154105	2,4613	0,02417	**
F (3, 18)	31,39295		P-value (F)	2,30e-07	

ns not significant; * 5-10%; ** 5%; *** 1%

Tab. 3- Main results of multiple regression model in 2010 *(Source: our elaboration on data www.istat.it Census of Italian Agriculture 2000 and 2010 and European Union www.europa.eu)*

	Coefficient	Standard error	t value	p value	Significance
Constant	13,2457	1,53704	8,6177	<0,00001	***
AS	1,61131e-06	4,97278e-07	3,2403	0,00481	***
WPS	2,3725e-05	3,01689e-06	7,8641	<0,00001	***
ln RDP	-0,0421794	0,0873549	-0,4829	0,63536	n.s.
F(3, 17)	29,50195		P-value (F)	5,79e-07	

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