

**The influence of producer's characteristics on the prospects and productivity of  
mastic farms on the island of Chios, Greece**

H. Theodoropoulos\* and C. D. Apostolopoulos

Harokopio University, El. Venizelou 70, Kalithea, 176 71 Athens, Greece

---

\*Tel.: +30 1 957 7051-5 Ext. 211, Fax: +30 1 957 7050, E-mail: [etheodo@hua.gr](mailto:etheodo@hua.gr)

## **Abstract**

The most well known product of the Aegean Greek island of Chios is mastic, which is globally unique and exclusively produced in particular villages at the southern part of the island. Mastic is an aromatic resinous substance exuded by the trunk of the mastic tree, which has many applications in confectionary and pharmacy. Mastic is also used as a raw product by chewing it as a natural sugar-free gum. Due to its wide spread uses, mastic is an important agricultural product for the local economy of the island. Despite the global uniqueness of mastic there is a present danger of abandonment of its production due to the lack of interest by the new generation farmers. The main reasons for this lack of interest are the harsh work required for the manual collection of the mastic drops by the trunk of the tree, the profit skimming by the intermediate merchants and the resulting low revenue for the producers. Mastic farming is a family operation, which may be disrupted by the disinterest of the new generation. The imminent abandonment of the mastic farms may lead to the desertion of the area. The objective of the present study was to examine the influence of producer's characteristics on the prospects and productivity of mastic farms. For this reason sample data on the demographic characteristics, education, employment status and income of farmers were collected. It was found that the demographic characteristics of mastic farmers influence the productivity and the prospects of their operation. Based on the results of this study various measures are proposed for the reconstruction and future viability of mastic production.

Key words: mastic, productivity, Chios island, Greece

## **Introduction**

Chios is a mountainous island in the Aegean Sea of Greece. The island's climate is characterized by mild weather and the longest sunny periods per year in Greece. Agricultural activities such as farming, livestock, fishing and agritourism are the main sources of income besides shipping for the people in the island of Chios. Among agricultural activities the production of mastic is considered the most important for the island's rural development. Mastic is a globally unique product, which is exclusively produced in 24 villages known as mastic-villages located at the southern part of the island of Chios. Mastic is produced by the mastic tree, which is an evergreen big bush whose height can reach up to three meters and usually grows in sunny areas close to the sea where the soil is dry and infertile. The mastic tree can live up to 100 years and producers start to collect the mastic when the tree is more than 10 years old (Kolliaros, 1997; Zaharatou, 1988).

Mastic is an aromatic resinous substance exuded by the trunk of the mastic tree, which has many applications in confectionary and pharmacy. Mastic is also used as a raw product by chewing it as a natural sugar-free gum. Due to its uniqueness mastic was a well-known product since ancient times and the island received a special treatment when Greece was under occupation because of the wide spread uses of mastic. Generally, mastic is an important agricultural product for the local economy of the island since mastic revenues count for 20% of GNP. Today, there are more than 2000 persons who have as their main occupation the production of mastic. Their communities were developed based on the needs of the mastic production and are located at the southern part of the island where the mastic trees grow facilitating the cooperation among producers (Theodoropoulou et al, 2003; Ellis, 1998; Alexopoulos, 1997; Corbett, 1996; Giagou, 1994; Damianos, 1991; Zaharatou, 1988).

The objective of the present study was to give an insight on the employment characteristics of mastic producers and the needs for future growth of mastic production. For this reason, by using empirical social research methods, sample data on the demographic characteristics, education, employment status, and income of farmers were collected. On the basis of these data the profile of the mastic producers in the island of Chios was constructed.

## **Materials and Methods**

The statistical frame of the study was based on 150 mastic producers living in the island of Chios. The size of the sample used in the study covered 7,5% of the total population of registered producers in the island.

Data on the demographic characteristics, education, employment status, and income of the producers were collected through a questionnaire survey. Investigators on location completed the questionnaires. The data collected were analysed by using descriptive statistics for calculating the means and standard deviations of continuous variables and the frequencies and percentages of discrete variables.

## Results

According to the data analysis the majority of the 150 mastic producers (54%) were women and their farm was family operated (58%). Most of the individuals were married (87%) and the average number of children per responder was two (56%). The educational level of producers was mostly elementary school (45%), while for 23% was high school (Fig. 1). The age of responders ranged from 51 to 60 (28%) and 41 to 50 (27%) years old (Fig. 2). Fifty percent of the producers had monthly family income up to €500 and for 93% of the producers their only family income was from mastic production (Fig. 3). Analytically, Table 1 describes the percentage on demographic characteristics of mastic producers. Also Table 2 shows the percentage differences on demographic characteristics between men and women producers of mastic.

Thirty two percent of the producers considered mastic production as their first occupation. Eighty one percent of the producers received subsidies up to €3000 per year for farming products other than mastic, but only 7% received a small subsidy up to €300 per year for mastic production. Furthermore, 84% of the producers would like to attend vocational courses related to their occupation to participate in agritouristic programs financed by E.U.

In addition, 87% of the producers replied that their parents were also producers of mastic. Most of them (44%) chose this occupation because they did not have another choice and only 7% replied that they chose this occupation because they liked it and 28% they did it for extra income besides their main occupation. Also, 42% of the producers were barely satisfied with their occupation and 21% were not satisfied at all, while the rest were satisfied. It was interesting that almost all of the producers (87%) replied that their spouses were not happy with this occupation.

On the other hand, most producers (54%) replied that they do not want to change occupation and the reason is because most of them are old and it would not be possible to find another job. Also, 74% of those producers who have children replied that they do not like their children to continue this occupation because it is a hard and low esteem job with low and uncertain payment. Ninety three percent of the responders said that the earnings from the mastic occupation do not cover their family's expenses. But when they were asked if they would sell their farm to a big company, which would be interested to take over the mastic production, they replied (91%) that they would not sell. Finally, they would like more help from the Government like advertising their products so they can attain better prices.

In addition, most of the producers (70%) do not hire any workers and the members of the family do all the work that it is needed in the farm. Those who hire workers they hire mainly (62%) just one worker them mainly during summer when there is the most of the work in order to collect the mastic.

## Discussion and conclusions

Chios is home to the mastic trees that are grown in the southern part of the island. The socio-economic life of the island is depending on mastic production. Even though the selling price of mastic is high compared to other agricultural products, producers are not

satisfied since mastic production is labor intensive all round the year and the cost of production is very high. For that reason researchers are trying to discover ways to facilitate mastic collection, which will improve the cost production.

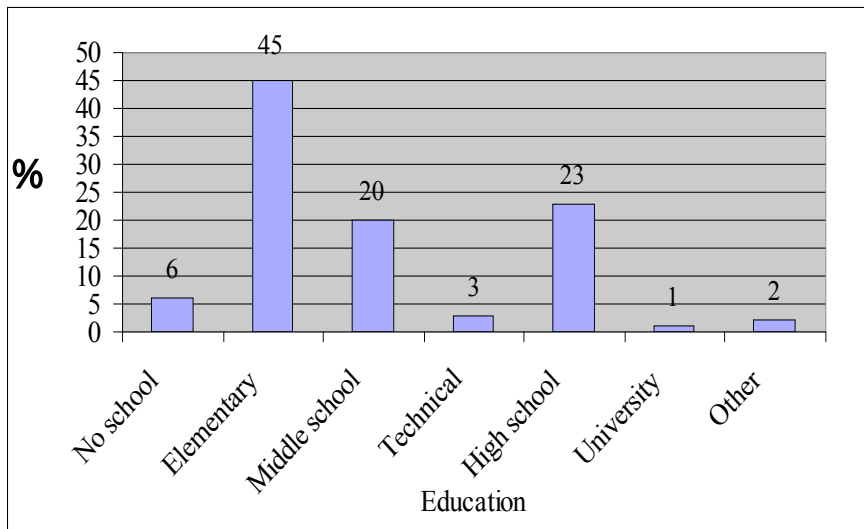
Based on the results of the present study the prospects for mastic production in the island of Chios are not optimistic. The agricultural labour force occupied with mastic production is ageing and the new generation is not encouraged by their parents to take over. On the other hand, farmers who opted to continue mastic production did so due to limited job opportunities. Since the economic and societal life of the island depends on the mastic production, wise investments should be directed for an infrastructure that will ensure the growth of mastic farming.

Some important observations made in the present study was that overall, most of the producers were of old age and low educational level and they were not satisfied with their occupation but they cannot change occupation because they are too old to find another job. For that reason they do not want their children to be involved with their parents' occupation. Also, the government does not give subsidies for mastic production and there is no vocational training or seminars for agricultural activities to provide information on new technologies and methods in the agricultural sector.

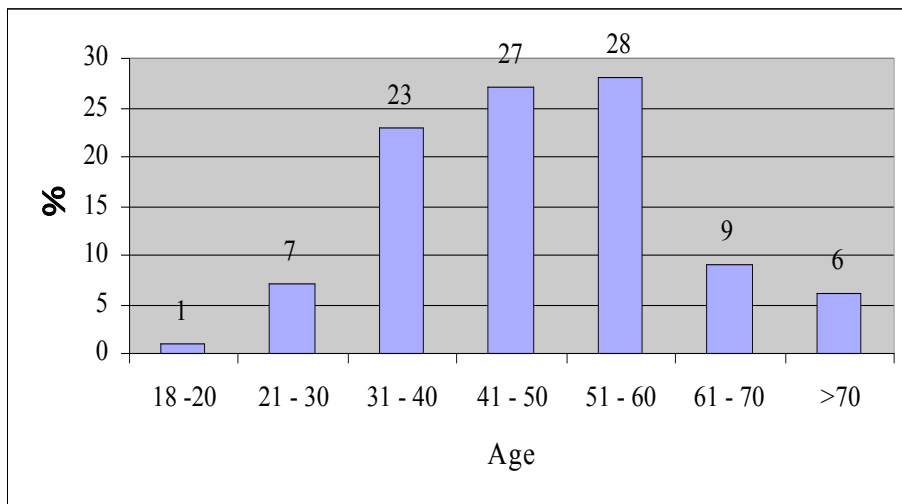
These trends are ominous for the future of the island, since farmers of old age and low educational level will not be able or have the time to adapt their enterprises to the future demands of globalisation in the market, while the people of the new generation are not willing to become the entrepreneurs of the future.

## References

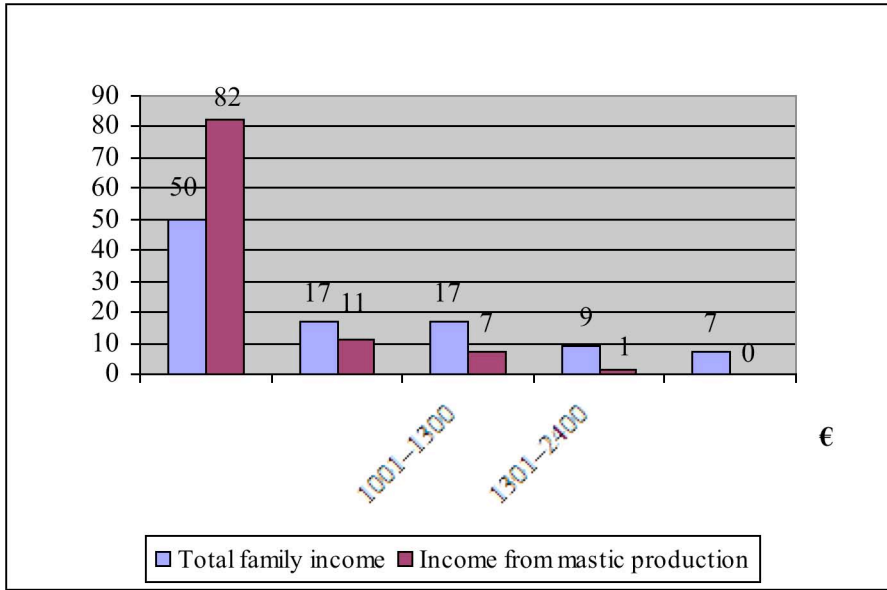
- Alexopoulos G., 1997. Pluriactivity of the agricultural households. Socio-economics characteristics. Pantio University. Athens. (in greek).
- Corbett J., 1996. Dynamic Processes in Food and Livelihood Systems: Links with Ecological Resilience. University College London.
- Damianos D., 1991. The Empirical Dimension of Multiple Job-Holding Agriculture in Greece, *Sociologia Ruralis*, xxxi [1], 36-47.
- Ellis F., 1998. Household strategies and rural livelihood diversification. *The Journal of Development Studies*; Vol. 35. Issue 1, pp 1-38. Frank Cass & Co. Ltd, London.
- Giagou D., 1994. Agritouristic Co-operatives in Greece. How do they function and what is their impact on the community and the household. M.Sc. thesis, Wageningen Agricultural University, The Netherlands (in greek).
- Kolliaros J., 1997. Chios's mastic since ancient times until today. *Journal Chioni*; Vol. 69/November. Chios (in greek).
- Theodoropoulou H., N. Mavrogeorgi., C.D. Apostolopoulos., 2003. Employment of farmers in the goat livestock and agritourism sectors of the mountainous island of Ikaria in Greece. International Symposium on Animal Production and Natural Resources Utilisation in the Mediterranean Mountain Areas. Ioannina, Greece, June 5-7.
- Zaharatou - Loutrari A., 1988. *Chios: History and Culture*. Municipality of Chios. Greece (in greek).



**Figure 1:** Percentage of mastic producers by educational level.



**Figure 2:** Percentage of mastic producers by age.



**Figure 3:** Percentage of mastic producers by level of income.

**Table 1.** Demographic characteristics of mastic producers (n=150).

<b>Characteristic</b>	<b>No.</b>	<b>(%)</b>
<i>Education</i>		
No school	9	(6)
Elementary school	67	(44.7)
Middle school	30	(20)
Technical school	5	(3.3)
High school	34	(22.7)
University	3	(2)
Other	2	(1.3)
Total	150	(100)
<i>Age (years)</i>		
18 – 20	1	(0.6)
21 – 30	10	(6.7)
31 – 40	34	(22.7)
41 – 50	40	(26.7)
51 – 60	42	(28)
61 – 70	14	(9.3)
> 70	9	(6)
Total	150	(100)
<i>Monthly income (€)</i>		
0-500	4	(50)
501-1000	12	(17)
1001 – 1300	9	(17)
1301 – 2400	7	(9)
> 2400	3	(7)
Total	150	(100)

**Table 2.** Percentage differences on demographic characteristics between men and women producers of mastic.

<b>Demographic characteristics</b>	<b>Men (%)</b>	<b>Women (%)</b>
Married	78	95
Have 2 Children	45	65
Elementary	41	48
Middle school	25	16
High school	17	27
Age 41-50	22	31
Age 51-60	30	26
€ 0 – 500	39	59
€ 501-1000	19	17
Main occupation mastic production	26	37
Second occupation mastic production	77	73
Parents producers	90	85