Adoption of ICT in the Greek Livestock Sector: Results of a Survey in the Prefecture of Thessaloniki

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Abstract

Our research team has carried out a series of studies over the last years to identify the use and impact of Internet as well as adoption of ICT in the Greek agricultural sector. A survey that we conducted two years ago examined a number of agricultural organisations and enterprises developed an Internet presence through a web site. Results of the survey indicated that the Internet is utilised and applied in non-professional way and has not yet satisfied many key expectations. These results clearly illustrated that the impact of the Internet is quite small and further initiatives and financial support from governmental organisations are required. Also the results revealed that the Greek farmers must adopt ICT in a larger capacity in order to provide the right environment and the critical mass allowing larger investments. Since we have identified that larger adoption of ICT by Greek farmers is a prerequisite for further development of IT in agriculture, we decided to conduct a study that examines the socio-economic and other reasons confronting Greek farmers to adopt ICT in larger capacity. This paper presents and critically discusses the results of that survey which was focused in the Greek livestock sector.

Key words: ICT adoption; Greek Livestock sector; Use and Impact of Internet

1 Introduction & Methodology

We have conducted various studies to identify the use and impact of ICT in the Greek agricultural sector. An in-place study that was conducted few years ago aimed to identify the potential use of ICT in the extension training and education of Greek beekeepers (Batzios et al, 2001). The study revealed that although most of the beekeepers expressed their difficulty in finding information that satisfies their specific training needs they didn't make extensive use of ICT (e.g. the WWW) to find information relevant to their needs. Later in 2002 we have conducted a survey based on a questionnaire to determine the use and impact of the Internet in the Greek agricultural sector.

Initial indicative (based on 40 responses) and final results of the survey (based on 78 responses) were presented in the first HAICTA conference (Salampasis et al, 2002) and the EFITA 2003 conference (Salampasis et al, 2003) respectively. Results of the survey indicate that the Internet is utilised and applied in non-professional way and has not yet satisfied many key expectations. For example, the study revealed that 72.6% were not satisfied by the results of their web presence in comparison to their initial expectations, only 7.3% of the total respondents were fully satisfied in relation to attracting new customers and 62.3% of them answered that they experienced a total failure in selling products or services through their web site.

Generally, it is clear-cut that ICT has not yet extensively utilised in the Greek agricultural sector. In our previous studies, one of the reasons for poor results is clearly identified the low ICT adoption by Greek farmers. In fact, our previous study about the use and impact of Internet in the agricultural sector indicates that governmental organisations, research institutes and commercial enterprises made some investments to adopt ICT in their daily operation. However, this investment is not widely accepted because of low ICT adoption from Greek farmers. Although, this fact is widely acknowledged, we are not aware of any large study investigating this issue. As a result, we decided to conduct a study in order to identify the current use of ICT by Greek farmers and to determine what are the main factors that could increase ICT adoption.

The study was based on a questionnaire. The questionnaire consists of 61 questions and is divided into 3 sections. The first section collects general information regarding demographic and socio-economic status of the farm leader such as age, education level, family status, etc. The second section collects data about the size of the farm enterprise such as number of employees, use of farm machinery etc. The third and larger section collects data about the use of ICT such as personal computers, mobile phones, Internet and training of the personnel in new technologies. The questionnaire used in the survey and full set of statistical analysis and results can be found in the following URL address: *http://aetos.it.teithe.gr/~cs1msa/ efita2005/agrosurvey.html.*

Table 1: **Origin of the sample**

Activity	Number of responses	Percentage
Cattle production	229	40,4%
Sheep and goat production	233	41,1%
Pig production	40	7,1%
Broiler production	23	4,1%
Laying production	20	3,5%
Beekeeping	11	1,9%
Rabbit production	4	0,7%
Ostrich production	7	1,2%
Total	567	100%

The questionnaires were filled with local visit and private interviews between November 2003 and January 2004. The total number of valid questionnaires collected is 567. Table 1 shows the distribution of responses according to the main agricultural activity of the farmers interviewed.

This large number of collected questionnaires, to the best of our knowledge, makes this study the larger ever conducted in Greece investigating ICT adoption by Greek farmers.

Descriptive statistics were used for the statistical analysis of the collected data. Data was further statistically analyzed addressing variables of demographic and socio-economic status of the farm leader (age, education level, family status, etc). Chi-square ($?^2$) procedure was also used and a number of statistical tests of independence were performed to examine the possible relation between each of the above mentioned characteristics of respondent's demographic and socio-economic status with the questions on the use of ICT. Furthermore, in case of significance, the Adjusted Standardized Residuals in the crosstabulation tables were carefully examined to detect departures from independence (Norusis, 1999). All statistical analyses were carried out using the statistical package SPSS 9.0.

2 Results & Discussion

2.1 Part I - General information and classification variables

The first part of the survey collects general information about the respondents and identifies basic variables that can be used to classify results. The analysis of the data collected reveals that there is a good distribution of respondents in respect of their age. Most of the respondents (44%) are between 50-64 years old. The 31% of the total respondents are 35-49, while 9% are between 20-34 years old. In fact, this result reflects current demographic situation in the agricultural sector with most of the farmers being relatively aged. Few young people are becoming farmers nowadays. Finally, not surprisingly, there is quite large percentage (16%) of the total respondents that are older than 65.

Of the total respondents, the 85% were male and only 15% are female. The majority of the total respondents (89.8%) were married and only 10.2% were single. In terms of their education status, a large percentage of 79% of the respondents have only elementary education (which is 9 years in Greece), while 59% have only 6 years of basic education. Only 17% have post-elementary education (12 years lyceum) and finally only a 4% have attended an institute of higher education (universities and technology institutes).

2.2 Part II – Use of ICT

Number of Computers in the farm

Between the respondents only 10% possess a computer. The computer is usually installed in the farmer's residence (75.4%) and only 14.5% uses the computer in their farm as a tool for assisting them in their business.

The respondents that already own a computer have declared various reasons for possessing a computer. The main reason is for using it in doing their business (79.6%). However, home entertainment (67.3%) and the education of their children (56.0%) play an important role.

The most important result of this part of the survey is that most of the respondents not having a computer declare that the difficulty in using a computer (57.8%) is the most important reason for not possessing a computer. The 53.1% claim that a computer is not useful for their business and a percentage of 44% say that lack of time is another reason. It is important to state that

very few (14.3%) mention as a reason for not possessing a computer the cost of buying a computer. This result is quite important because it indicates that the main reason for low ICT adoption is not the high cost. Low usability of ICT is probably one very serious reason. Despite the efforts to increase usability is it widely recognised that computer technology is not very mature and PCs are not simple to use (e.g. so simple like a TV for example). However, the most important reason is lack of interest because farmers don't know any "killer" application, in other words they cannot recognize a clear benefit in using a computer.

It is also important to mention that most of the farmers reply that they do not intent to buy a personal computer despite that may be funded for such a purchase. This is a striking result which clearly shows the low interest of farmers to invest time using some type of ICT.

Use of Internet

The results in terms of Internet use are even more disappointing. Only 5.5% of the respondents are using the Internet and only a small percentage of them (29%) are making daily use of the Internet. Most of those using the Internet are connected from their home. The most important reason for using the Internet is general information seeking (e.g. use of weather service, news services etc.). Very few of them use the Internet for more sophisticated tasks such as to get information about their business (e.g. price monitoring). Another quite important reason declared by those using the Internet is for their training and education. Finally, it is quite important to state that from those not using the Internet, only a very small percentage (13.8%) expressed their interest to get connected in the future.

Use of e-mail

The survey exposes another poor result in terms of e-mail use. Electronic mail is regarded one of the most important communication service found in the Internet that can be used relatively easy. It is an asynchronous method of communication which is widely used internationally. Despite this fact only 3,5% of the respondents use e-mail.

Again only a very small proportion of the respondents (11%) answer that they would like to use e-mail service in the future. Almost the 61% are positive that they are not going to use e-mail in the future mainly because they not identify any benefit.

Use of mobile phones

Pretty much in line to our previous studies most of the farmers use mobile phone technology (60.7%). From an ICT adoption perspective, it is clear cut that mobile phone technology could play an important role due to the large dispersion between farmers. We strongly believe that new mobile phone technology such as 3G may provide an efficient and easily applied underlying platform for developing services that could be used by Greek livestock farmers.

3 Limitations & Conclusions

In general, we consider this study as an important step towards identifying the use and the impact of ICT in the Greek agricultural sector in general. The study reveals that ICT adoption by farmers in the Greek livestock sector is very low. There is some variance in this general conclusion depending on the age of farmers, their marital status, education level etc. but in

general the results without a doubt demonstrate that more efforts are required to increase the level of ICT use by Greek farmers.

Most of the farmers responded that they do not use a PC because they cannot recognise any benefit in using a PC. Many farmers also answer that they find difficult to use a PC, a reply which to our opinion shows the immaturity of PC technology.

The only ICT technology that is widely adopted is mobile phone technology. 60% of the farmers in our survey possess and use a mobile phone daily. To our opinion, this result should be taken into account by IT professionals and direct their software and development of IT solutions towards this direction. Probably in Greece and in other countries, which have such high adoption rates of mobile phone technology, it can be used as a "Trojan horse" to deliver to farmers IT applications and services that are easily accessible and easy to use. Especially with the new high speed cell network protocols such as 3G and GPRS which promise fast multimedia delivery and fast connection to the Internet, mobile phones can be proved as the best devices for Greek farmers.

In general, the results of the survey are disappointed and can be summarised as follows:

- Adoption of ICT in general and Internet in particular is very poor.

- It should not be expected that ICT adoption rates could change dramatically in the near future. The demographic characteristics of Greek farmers and low efficiency of the Greek livestock sector are the two main reasons for low expectations in terms of increasing ICT adoption rates.

- Mobile phone technology is widely used but prominently for communication purposes.

It can be easily concluded that serious interventions and actions are required in order to increase ICT adoption in Greek farmers.

Acknowledgements

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