Information Technology, Social Networks and Management Activities in Rural Areas

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Abstract

Information and Communication Technologies (ICTs) have gained attention in the last decades supporting personal and professional activities. The use of mobile devices expands the boundaries of ICTs benefits, allowing their use, of example, in remote locations. In this study, we analyze the role of ICTs to support management activities in rural areas. To do so, we use a dataset of responses from 116 farmers located in Minas Gerais, that is a relevant area of the Brazilian agribusiness sector. The descriptive analysis indicated that WhatsApp was the application with highest frequency use during the week. Moreover, the respondents perceive that they have the necessary resources to use ICTs, as well as the appropriate knowledge of these resources. However, the constructs related to compatibility and resources presented a non-significant effect on ICTs usage. The main determinants related to the use of ICTs in rural locations seem to be related to age, gender and social media use. This study reinforces the role of internet, social medias and information technologies to support management activities in rural locations. ICTs can facilitate communication, document sharing, marketing strategies, access to agroecological products, especially for those farmers live far from town.

Keywords: Diffusion of Innovations; Social Networks; Brazil; Information Technology.

Highlights

- The respondents believe that mobile devices have a good compatibility with their daily management activities;
- The use of social networks to facilitate the management in rural areas presented a relatively low frequency;
- Age and Gender are control variables that help the understanding of ICTs adoption in rural areas;
- A half of the sample also use social networks for personal purposes;
- WhatsApp seems to be the App used with a higher frequency by the respondents to support their agribusiness management activities;
- Instagram received small adherence in the context of rural management activities.

1. Introduction

Some Information and Communication Technology (ICT) resources, such as mobile devices, have both hedonic and utilitarian values (Malaquias & Hwang, 2017). Therefore, farmers can use ICTs for private purposes, i.e. as leisure, and also to support the execution of managerial practices. In this way, farm business can get a better performance using the internet (Khanal & Mishra, 2016), social medias (Morris & James, 2017;) and smartphones (Michels et al., 2019) in the management, among other mechanisms related with ICT. Although these advantages and the identification of ICT as a source for agriculture information for farmers, Aldosari et al. (2019) verified that part of farmers still have doubtnesses about the useful of it, and these authors proposed the lack of education and the lack of resources as factors that can justify such perception.

Then it is relevant to identify how farmers deal with ICT and how this use are apply to the management, once the technology improves practices related with it. The understanding of these characteristics can contribute with the development of strategies that aims to help farmers to achieve better results. Considering a financial management perspective, ICT provides resources to facilitate information access and financial operations. It is the case of mobile

banking and internet banking, that removes physical limitations to the banking activities (Merhi et al., 2019), an important benefit for farmers who lives far from town. Besides that, the use of technologies can reduce farmer's indebtedness, a factor that contributes not only with their financial stability but with their mental health too (Datta et al., 2018).

ICT can bring positive effects on innovation and knowledge management yet (García-Álvarez, 2015), and small companies have better communication with clients using ICT, "which is a basic factor to their development and growth" (Malaquias & Hwang, 2016, p.6). Especially in the rural context, such technologies can act in business-to-business platforms (Barmpounakis et al., 2015) – which contribute with implementation and reformulation of business collaborations. Moreover, the blockchain technology can act on agriculture data integrity providing a secure storage for them (Hang et al., 2020). ICT still helps to identify market opportunities (Hoang, 2020) and agriculture services can be extend with the use of ICT, (Birke & Knierim, 2020), what it is especially relevant in areas where digital inclusion are in progress.

Therefore, there are many advantages of ICT in supporting management activities, and information technologies can provide better conditions of business management for rural producers. Resources related with ICT, such as mobile devices, reduce the time spent by farmers with displacement, improve their communication, and optimizes processes (Islam et al., 2018). In relation to mobile phones, for instance, Msoffe & Lwoga (2019) verified that they provides better opportunities for increasing incomes and reduce vulnerabilities experienced by Tanzanian farmers. Thus, farmers must get access to ICTs and become able to handle them because this can contribute to their management practices while adopting new resources to do it. This figure can improve the performance of their businesses and benefit their communities in a social and economic perspective.

In the context of a developing country that has a relevant participation of agribusiness in its economy, the improvement of rural management with new resources and aligned with society as a whole should be a permanent goal. This is the case of Brazilian, in which agribusiness plays a relevant role in the economy (CNA, 2020), and is responsible for the majority of the exportation products (CNA, 2017). The use of ICT is increasing among Brazilian farmers (ABMRA, 2017), so it is an interest point to understand if this use is applied for the management and in which ways. Thus, this paper aims to answer: **How rural producers located in a relevant area of the Brazilian agribusiness use tools related with ICT to manage their farms?** That comprehension can help governments, rural cooperatives and other interested in the improvement of rural management to develop training programs for farmers. In your turn, a better management can lead to better results and generate benefits for farmers and their communities.

2. Literature Review

2.1 ICT devices, Social Medias and Compatibility

There are many advantages of using ICT to execute organizational tasks. For instance, the management of human resources can be improved with the use of social medias. These tools mitigate communication barriers between bosses an subordinates, support the process of recruiting, selecting, evaluation and engaging people, and reinforce workforce interaction (Yokoyama, 2016). Similar benefits are observed in the context of Brazilian companies, including advantages for business's marketing (Yokoyama & Sekiguchi, 2014). In the New Zeland, Ollington et al. (2013) highlighted, among other findings, the relevance of Facebook to attract and screen new human resources. The authors pointed yet that "companies can also proactively engage with social networks by building their own"(Ollington et al., 2013, p. 262). The results of the abovementioned studies indicate the relevance of social medias, as well the devices associated with use of them, to upgrade practices of management human resources.

The ICT can be compatible with other technologies used by the users, which can optimize process and the time spend with the management. In this way, Venkatesh et al. (2003, p.453) stated that the "compatibility construct incorporates items that tap the fit between the individual's work style and the use of the system in the organization". For Yoon et al. (2020, p.4) "if smart farming technologies are compatible with a farm's current work, the farming organization will be more likely to adopt it". The authors concluded this after they observed compatibility as the most important factor in the adoption of new technologies in rural organizations in Korea. The compatibility also had a positive and directly effect on intention to use mobile government services between Tanzania farmers (Mandari et al., 2017).

Furthermore, customers can search for references about a product or service in tools available in mobile devices and the on-line reviews of users can influence the purchase intention. Naeem (2019) identified Facebook, WhatsApp and YouTube as the most used platforms for that purpose in the context of an Islamic country, including the use by the customers of discussion groups in Facebook and WhatsApp. Then, it is important that managers deal with those mechanisms witch can collaborate to understand the perception of customers about the service or product or to give feedbacks about complaints. This can generate benefits arising of a better fostering responsiveness and increase the reliability and empathy of the customers (Naeem, 2019a). The advantages of ICT for communications with customers and business partners was observed in the context of Ghanaian micro-entrepreneurships too (Asiedu et al., 2019).

Especially in rural areas the relevance of tools associate with ICT goes beyond the relationship with customers and can be still associated with social learning. Shaijumon (2018, p.1) pointed that communication helps the social learning process by farmers, once it "reduces the individual costs of information about agriculture know how". The author analyzed the Village Resource Centre concept in India, and emphasized the relevance of participation of the different actors involve with the farmers for this process, as well the importance of interaction of formal and informal knowledge and technology sources. This set that involves the interaction of providers, friends, farm advisors and others, with the help of ICT resources, can give to the farmers knowledges that would not being obtained without that process or it would be get in an expensive way. Still in India context, Jain et al. (2016) mentioned that mobile devices are an easy to use means, with economical rates, to voice and data transfer, and for farmers obtain information about agriculture.

Morris e James (2017) observed that social medias, such as Facebook, develops an important role for farmer's strategic decision-making process. According to the authors, these medias can collaborate for the cooperation in the agriculture sector, provides conditions to innovate the supply chain and aggregate value to the products. In your turn, Kumar et al. (2020) identified a significant relationship between ICT and the logistics integration and supplier relationships in the agri-food supply chain. Therefore, mechanisms associate with ICT can possibility better conditions for farmers deal with suppliers, providing tools that can benefit the interaction of these actors and the relationship with customers as well.

When analyzed the relevance of resources related with ICT for the Romanian rural area competitiveness, Serbu (2014) pointed that should be a priority stimulate knowledge and innovation through agriculture, research and e-agriculture, and this would contribute to rural development. In this way, Ratten (2018, p. 19) highlighted that education technologies can be used by Australian policy makers "to show how coopetition can increase profitability in the long term for farmers", helping the development of rural regional areas. In your turn, Omulo e Kumeh (2020) analyzed the potential of mobile phone to improve smallholder farmers' performance in Kenya through a SMS based knowledge-sharing platform. Despite the identification of gaps to the adoption of ICT for farmers, there were the perception by the authors that these technologies can qualify farmers to reach their livelihood.

Therefore, it is note that farmers can be more competitive with the use of ICT, but the advantages goes beyond that. This technology helps the sharing of information, the mutual learning by farmers, and the formulation of their strategies, besides others benefits presented. So, while gain a better performance with the use of ICT the farmers can become more competitive not just between them, but in front of another markets. This can strengthen the economy of their communities, which is especially relevant in a country with an economy based in agribusiness. Considering the abovementioned points, we propose the hypothesis:
H1: The use of ICT devices by Brazilian farmers is positively influenced by the use of internet and social medias for management purpose.
H2: The use of ICT devices by Brazilian farmers is positively influenced by the compatibility.

2.2 ICT devices and Necessary Resources

Some factors can be a barrier to the use of ICT. In relation with Brazilian farmers, Malaquias e Silva (2020) verified the perception of usefulness, the trust and the perception of to be easy to use as elements positively associated with the adoption of mobile bank. Therefore, may be important training farmers to use mobile devices and mobile app, showing the usefulness of these technologies to the management and helping them for a safety use. Likewise, farmer may be encouraged to the use if these mobile devices and app have an intuitive interface.

This is in consonance with the findings of Wyche e Steinfield (2016) about the use of management information system by Kenyan farmers. The authors verified mismatch between the design of the system and the farmer's perception of the phone's resources. To solve this, they proposed that software developers "reconsidering the design of mobile phones, and developing innovative educational interventions" (Wyche & Steinfield, 2016, p.11). Besides that, the authors verified characteristics that could discourage the use of mobile devices by the farmers – some of it related with the rural environment where the devices are used –, such as the difficult to reading the screen when in the field in sunny days, unskillfulness to the text input, inadequate illumination at home and the wear of the devices after some time.

Notwithstanding the use of mobile phone being increase among farmers – overriding others tools of information –, education level and income (Lwoga & Chigona, 2017), and knowledge to the use and gender (Owusu et al., 2018) are also elements that can differentiate user and non-users in rural areas. Similar characteristics were observed by Lu e Chang (2016) in relation with the use of internet by senior farmers. The authors identified the difficult to connect, the perception of being too old to learn, the expensive access, and not having a device to connect as barriers to these farmers use the internet. Besides that, some farmers declared they have fear of computers, they have slow speed of typing or they just are not interested in using the internet. It is expecting of young to have a greater inclination for the use of technology then the older ones. In this way, Juhaňák et al. (2019) verified that a child who starts to use the computer early, presents a higher ICT competence and ICT autonomy years later. In addition, Soja and Soja (2020) highlighted that the adoption of technology in the organizational context needs the cooperation between the different generations involved, in order to reduce the insecurities of the older. Considering those, the age is usually included as moderation variable in the models of technology adoption.

Based on the affirmation of Minton and Schneider (1980) about male being highly task-oriented, models of technology adoption has included gender as a moderation factor too. By this view, males would have a higher disposition to adopt technologies than females. Through a systematic review of gender divide literature, Yeganehfar et al. (2018) conclude there is a gender gap in the use of ICT. For increase the participation of women, the authors suggested their knowledge and abilities needs to be reinforcing, with equal educational opportunities, and they need to have a place in work positions that demand the use of ICT skills. The lack of equal

opportunities and treatment for women seems to be more explanatory than an innate inclination towards the adoption of technologies.

Once mobile phones can help farmers to develop their human and social capabilities, reducing their vulnerabilities (Msoffe & Lwoga, 2019), and the internet can directly affect the income growth of rural residents (Zhou et al., 2020), those barriers must be faced and solved for increase the use of ICT by farmers and, consequently, they could get the benefits provide by technology. This was highlight by Benard et al. (2019) when they obtained a negative relation between challenges associated with the use of ICT and the usage of it by fish farmers. About the use of social medias, Morris e James (2017) pointed the connectivity, technology related, training, awareness, and suitability as constraint to the adoption by United Kingdom's farmers. Despite the positive attitude of young farmers towards technology, "the lack of understanding of the tangible benefits social media can provide" must be clarified and associate with a supporting infrastructure for increase the usage (Morris & James, 2017, p. 1041).

The digital divide issue is another restraint to farmers overcome. "Not all members of society have access to ICT or to the benefits they bring" and "those who lack access to them become further disadvantaged, since information and services are increasingly, or solely, provided via the new technologies" (Rooksby et al., 2002; p. 197-198). Many factors can be point as causes for digital divide and, in the context of farmers, one of the main ones is the infrastructure inequality when we compared rural areas with urban areas (Adeleke, 2020). Despite farmers can reduce problems related with their remoteness of town with the use of technology, rural areas generally have worst conditions for connection and speed broadband, and even in the cases in which these locals have infrastructure for it, still can have resistance or personal limitations to the adoption (Townsend et al., 2013).

Malaquias and Albertin (2019) analyzed challenges for diffusion of Internet of Things (IoT) in Latin America considering characteristics relates with the individuals, the environment and the technology offer. Such as Venkatesh et al. (2003) and Koksal (2016), the author pointed the age as a factor for usage of technologies. Some possible reasons is that would be harder for old people handle with these resources or they could have a less rate of trust in them. Likewise of Adeleke (2020), Malaquias and Albertin (2019) concluded yet that the infrastructure of urban areas tends to offer better conditions for the use of technologies, so it is important to promote conditions for rural areas to have the same opportunities. Furthermore, the use of technology depends of basic servicer, as the electricity and internet access, while the security and privacy of devices are also a relevant factor. Thus, we propose the hypothesis:
H3: Having the necessary resources to use ICT devices positively influences the use.

3. Methodology and Statistically Describes

This research was conduct in the Minas Gerais state, one of the most relevant areas for agribusiness in the Brazil. Through the paper-and-pencil method, we developed and collected 113 structured questionnaires answered by farmers, applied from December of 2018 to April of 2019. The participants are producers of several farm products, such as milk, cattle, vegetables, soy and corn. With the aim of verify the use of mobile phone, tablets, notebooks and computers for the management process, we applied a multivariate regression. For this purpose, we considering the use of internet and social medias (Facebook, Instagram and WhatsApp), related necessary resources to the use, and the compatibility as variables that could influenced the use of those devices.

The dependent variable (USE) and the explicative variable related to the use of internet and social medias (MED) are the average of days per week on that farmers use the tool for the management. In your turn, the explicative variables necessary resources (RES) and compatibility (COMPAT) were obtain through the average of the answers in the Likert scale from 1 to 5, where 1 means "totally disagree" and 5 means "totally agree". The Cronbach's

Alpha of the constructs ranged from 0.69 to 0.77, indicating the reliability of them. Considering the impact that age (AGE) and gender (GEN) can impose in the use of ICT (Venkatesh et al., 2003; Koksal, 2016; Lu & Chang, 2016; Owusu et al., 2018), these variables were include as control.

The Appendix A presents the statistically describes of the items used in the quantitative analysis. The average of USE was 2.18 days per week, showing there are space to expand the use of ICT for the rural management among Brazilian farmers. Analyzing the items of this construct, we observed that the most ICT resource used for the management is the mobile phone (on average 5.44 days per week). This reinforce the data of Ambra (2017) about the increase in the use of mobile phone by Brazilian farmers. While using those tools for the management, the farmers can obtain the benefits associates with it and pointed by Msoffe and Lwoga (2019), Omulo and Kumeh (2020) and Malaquias and Silva (2020). In the other hand, the less devices used were notebooks (1.51), computers (1.31), and tablets (0.44). A possible reason for a low usage of these devices is the less maneuverability in comparison with mobile phones. When the farmer are in the field or handling with the production, it can be difficult for him/her to use larger devices or devices that usually need the both hands to the usage.

The average of the variable MED was 2.55 days per week, which indicates that farmers are underuse the internet and social medias for farm management purposes. In line with Naeem (2019), we observed that, between the components of this construct, WhatsApp is the most used tool. The farmers use this app for the management on average 5.03 days per week, and 64% used it all the days of the week. A layout easy to use and the gathering resources such as text massage, voice massage, video call, group discussions and the possibility of make advertising through the status are characteristics that can explain the preference for WhatsApp. The internet was use on average 3.3 days per week. Once are many the advantages internet can brings to the management, positively affecting the farm's performance (Khanal & Mishra, 2016; Msoffe & Lwoga, 2019), it is an interest point to increase the use of it by the farmers. In contrast with Naeem (2019), the Facebook is the second less used platform (0.8 days per week), indicating the farmers are not exploring the benefits of this tool pointed by this author and for Morris e James (2017). Considering that Instagram has become even more popular and many users have migrate from Facebook to it (Hou & Shiau, 2019), Instagram seems to emerge as a relevant platform for business. However, it is the least used platform by the farmer – on average 0.51 days per week.

The farmers agreed they had the necessaries resources and appropriate knowledge to the use of ICT. In the scale from 1 to 5, the respondents answered 4, on average. We observed they had a higher perception in relation to have the necessary resource and knowledge to use mobile devices (4.37 and 4.07, respectively) in comparison with the knowledge to use internet (3.82). In the same way, was 4.08 the average of the construct related with the compatibility. Therefore, on average the farmers agreed when questioned if mobile devices were compatible with others technologies and with their day-to-day activities. According to previous studies (Mandari et al., 2017; Yoon et al., 2020), such perception about compatibility could affect the adoption of ICT resources and improve the use of technologies by the farmers.

The age average of the participants were 52.57 years and 93.8% were males. However this discrepancy between males and females, it is note when analyzing previous researches in the Brazilian context that women farmers are less common in the studies (Bracht & Werlang, 2015; Ferreira et al., 2017; Almeida & Massarani, 2018; Maia et al., 2019; Richards et al., 2020). Additionally, the census of agriculture of 2017 evidenced that 86% of Minas Gerais' farm are management by males (IBGE, 2018). Thus, the sample seems close to the observed in the population. For the regression analysis, we considered gender as a dummy, assigning 0 for females and 1 for males.

4. Results

Once the Breusch-Pagan/Cook-Weisberg test indicated a possible heteroscedasticity, we estimated the regression with robust standard errors. The Table 1 presents the results of the regression:

Table 1
Regression results

The adjusted r-square was 40.7% and there is no evidence of concerns related to multicollinearity, based on the results of the VIF statistic. The variables MED were significant at the 1% level; the variable GEN were significant at the 5% level, and the variable AGE were significant at the 10% level. Therefore, we did not reject the hypostasis H1, as well as the influence of gender and age in the use of ICT devices by farmers.

Therefore, the adoption of ICT devices as mobile phones, computers, tablets and notebooks to management practices can be influencing by the use of internet and social media for that purpose. In other words, part of the farmers understands the advantages of using internet and social media for the rural management and this perception can contribute to their adoption of ICT devices for the same purpose, once these devices are necessary for the use of the components that composed the variable MED. The perception of the farmers about the benefits arising for the use of internet and social media for the management can be aligning with previous studies. The Facebook can be a tool to attract and screen new human resources (Ollington et al., 2013), to the farmer's strategic decision-making process (Morris & James, 2017), and, as well as the WhatsApp, to customers obtaining information or giving feedbacks (Naeem, 2019). Furthermore, farmers can achieve a better performance with the use of internet (Khanal & Mishra, 2016).

This result reinforced the relevance of internet, social media and related mechanisms in the farm management context. Even if the farm is located near the town, it can be difficult to the farmer displace out of his/her property. Those technologies facilitate the communication with customers, employees and providers, through text message, voice massage, document sharing and video call, decreasing the need for move out the farm and streamlining processes. Through the internet, the farmers can obtained governmental information of interest and realize tasks that, without the internet, would demand their presence in a government office. The farmers that sell directly to the consumers (usually the small producers) can publicize their production on Facebook or Instagram, reaching a greater number of potential buyers. By the way, there are groups on WhatsApp created by agroecological products cooperatives to sell their production. All these benefits arising for the use of internet and social medias in the management can possible contribute to the adoption of ICT devices.

The results confirmed farmer's gender as a mediator to the adoption of ICT for the management. This is in consonance with the study of Owusu et al. (2019) and can indicate a gender divide in the use of ICT, like pointed by Yeganehfar et al. (2018). The low percentage of women in the sample does not allow strong statements about it. However, the low participation of female, observed also in previous studies conducted with Brazilian farmers (Ferreira et al., 2017; Almeida & Massarani, 2018; Maia et al., 2019; Richards et al., 2020), can by itself indicates that the role of women in the rural management are still underestimated. Possible reasons for this it is social and cultural factors, for instance. This highlights the view of Yeganehfar et al. (2018) about the necessity to offer equal opportunities to women develop their skills and competences in ICT. This could give them space to be protagonists in rural management with the use of ICT.

In contrast with studies that hypothesized the adoption of technologies as negatively associated with the age (Lu & Chang, 2016; Owusu Kwateng et al., 2019; Soja & Soja, 2020), the AGE was positively and significantly associated with the use of ICT in this research. Thus, it seems that farmers older adhered to the usage of ICT for the management. Such as recommended by Soja e Soja (2020), maybe the old farmer has had the help of younger families, friends or employees to the managerial transaction, and became adapted to the use of ICT besides his/her age. We cannot discard the possibility of the older farmer in the sample be willing to learn to deal with ICT by themselves. However, the usage of ICT for the management is still low on average, as we observed in the statistic descriptive. Therefore, besides the satisfactory outlook of farmers that usually would have difficult to handle with ICT being indeed able to handle with it, there is a relevant gap in the use of ICT for management purpose.

The insignificance of the variable COMPAT and RES goes against the hypothesized by previous studies (Adeleke, 2020; Malaquias & Albertin, 2019; and Mandari et al., 2017; Venkatesh et al., 2003; Yoon et al., 2020; respectively). Related with the no influence of RES to the adoption of ICT devices, a possible reason is, despite the farmers have the necessary resources to use these tools in the management, they prefer do not do it. If farmer thinks they have the necessary resources when they actually do not have, this also could cause the no significance of the variable. Related with the no significance of the variable COMPAT, a possible reason is also the perception of the participants about the technologies they handle. Our research instrument could not capture such particularities and this was a limitation of the study.

5. Conclusion

This study analyzed the adoption of ICT devices in the management of farms in a relevant region for the Brazilian agribusiness. We developed and applied a questionnaire to investigated factors that could influence that adoption. The 113 participants of the study were producers of a range of products, such as milk, corn, cattle, vegetables, soy and fruits.

We verified the farmers used ICT devices for the management on average 2.18 days per week and the most used device was mobile phones. One of the possible reason pointed to explain the larger use of mobile phone was the facility to handle with this device in comparison with notebooks, computers and tablets. The social medias were used on average 2.55 days per week to the same purpose, while internet was used 3.3 days per week. The most frequent of these tools used in the management was the WhatsApp. We proposed as justification for this preference the aggregation of many resources in this app.

Considering the wide range of advantages arising from the use of ICT in the business management, there is space to expand the use of these technologies among Brazilian farmers in order to provide them with modern managerial practices. Especially for small farmers, there are cases in that the use of social medias as Facebook and Instagram can improve their performance. Once we noted these tools are underused, it seems relevant ability the farmers with the knowledge and resources necessaries to expand their competitiveness and strategies through social medias.

Through a regression analysis with robust standard errors, we also identified that possibly the use of internet and social medias applied to the management, the age and the gender of the farmer exercise a positively influence to the adoption of ICT devices for the management. Thus, the use of ICT devices for rural management possibly increase when farmers know the relevance of internet and social medias to the business and decide to use them. Differently of the major literature, we observed a positive association of the age with the adoption of ICT devices in the management. A possible reason for this result is that farmers learned handle with technology spontaneously or with the help of younger relatives, friends or others. In your turn, we identified the gender male as positively associated with the use of ICT devices in the

management, which were support by the literature. This result reinforces the need of empower the women in the rural context, offering resources to they develop skills and competences in ICT accordingly to their perspectives and specifics needs.

This study contributed with the literature because we observed relevant characteristics of the rural managerial of the Brazilian farmers in the use of ICT perspective. Besides that, we analyzed characteristics that were not observed before in the Brazilian rural context, such as the use of Instagram for the rural management. The results presented can contribute for futures studies in this area. In a social point of view, this study revealed factors that should be observed by those interested in the improvement of rural management in the Brazil. Once are many the advantages ICT can brings to the management, the presents analyzes can support strategies to coach the farmers.

We recommend that further studies go deeper to identify elements that could justify the positively effect of AGE to the adoption of ICT devices. Factors as the formal education and social influence should be investigated.