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# Raising Farm Efficiency Through The Use Of ICT

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***Abstract*****:** *ICThas revolutionized the way of doing business. Nowadays the use of ICT is present in different disciplines and areas of economy. In this paper it will be discussed theoritically and empirically on the advantages of ICT use in the field of agriculture. Considering the actual conditions that the Albanian farms operate in market today, applying a new web is proposed. Thus it will be possible for promotion to happen, which has been absent so far, as well as marking of product that is being made. The system allows every farmer to have access on it by creating a personal account. By using it, each farmer can do any marketing, give information on the product, set the price and compare his prices with the ones of his competitors in real time, deliver the product selling it directly to the last consumer or set links with mediators, and a farmer can even search the market by analysing the input data that the web receives. This multifunctional system, which enables the two way communication, will be set up by using the main programming language that is PHP. The programming is based on one template. The screens programming is based on html5 and CSS3 language. The database used is my SQL and its area of use is php my admin. The programming was made with waterfall model. Once using this system, the farmer comes out of isolation together with the product he offers and he can advertise the product at a low cost, as we think of offering this system for free, thus taking the first steps towards building a 'win win' system for the customer, who is introduced to the local products, with the product location, and with a farmer who is better informed on the market. But even the state as well as the regional agriculture institutions will have a clear image and a first step towards the agricultural products commerce, thus leaving behind a difficult situation for now and a long time in Albania with an agriculture sector growing but with few markets.*

***Keywords*****:** *ICT, PHP, Agriculture, SQL, CSS3*

## I. INTRODUCTION

The intensive use of land for the production of agricultural products has highlighted two important issues. On the one hand there is the necessity of development based on the principles of sustainability and on the other hand the increase for the need of accurate information about the safety and quality of agricultural products consumed by customers

The concept of sustainable development is a multidimensional concept which has been given special importance in recent years. Sustainable development promotes the use of resources efficiently meeting the needs of the present generation without compromising the needs of future generations so that it meets their needs.

A significant source of meeting the needs of customers is agriculture. Requirements for agricultural products have been steadily increasing. Despite the expansion of cultivable surfaces and technological advancement, a high pressure on agricultural land continues to be exercised, thus placing into question the sustainability of development. Agriculture is an important sector of the economy, especially for the developing countries like Albania. However farms in developing countries are not economically viable. Economic instability is due to several factors, such as old technology, small areas of cultivated spaces, lack of stable markets and low promotion of agricultural products.

Information systems and the use of technology has been widely used in agriculture in recent years in various countries. The information and communication technology involves the use of hardware and software with the scope of collection, processing, analysis and transmission of data presentation in different formats (images, graphics, text, etc.). ([1]). The information and communication technology can be used to increase the efficiency of farming and making agricultural products grown by farmers in developing countries to be more competitive in regional and global markets. The information technology has lower implementation costs but provides many advantages for farmers and not only. The bond of

information technology with agribusiness helps in different directions as: reducing production costs through the more efficient management of the database, promotion of the product with the lowest cost, connection to different markets, collection and analysis of data etc.

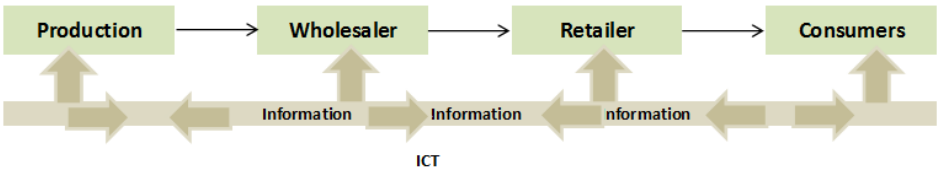
In this paper it will be analyzed how information technology can be implemented on farms in Albania. This paper is structured as follows: in the second section a review of literature on how information technology is used in different farms in developing countries is presented. In the third section the characteristics of the agricultural sector in the region of Vlora, Albania will be described. In the fourth section the methodology used to create a web page for agricultural products produced in the region will be described. Conclusions and recommendations will be given in the last section.

## II. THE ADVANTAGES OF IT IN AGRICULTURE

The information and communication technology has become part of everyday life and it is believed that ICT brings economic and social development. Various economic activities have become linked and interdependent of each other. Information and communication technologymay be used to increase productivity and efficiency of farms. Technological advancements and their use in agriculture can transform radically farm management.The use of ICT in agriculture creates opportunities to empower farmers, to provide information and increases interaction between the parties. Using ICT can provide services such as:

- *Sharing information* on market and prices. Technology, the climatic conditions best practices of the market. In Kenya farmers have daily information on market prices of agricultural products via SMS ([1]). MISTOWA organization of information exchange and trade of western Africa cooperation is an example of PPP. This organization has developed a web platform which provides information on real-time market and thus itallows interaction between buyers and sellers.
- *Increase in the productivity of farms*:the plantations productivity is different and is influenced by numerous geologicaland climate factors, and the crops cultivated. ICT can help increase the productivity of plantations by providing important information to farmers about the most suitable crops for cultivation, and the way of treatment of these crops.
- *Making farms more efficientby reducing costs and through the dissemination of knowledge and information* [5]. The use of different sensors and their connection to the network provide the farmers with accurate information in real time about the parameters of soil and plant needs for irrigation or fertilization. In this way farmers use water and fertilizer resources more efficiently by significantly reducing costs. On the other hand the management and dissemination of knowledge acquired from accumulation and experience between farmers helps them become more efficient. Knowledge is regarded as the fourth mostimportant factor of production after labor, land and capital (3]. Allowing farmers access to relevant production, the production allows them to improve production methods and thus increase productivity. For instance, E.Chupal in India provides farmers with information and suggestions on the best practices of cultivation. Other examples to be mentioned are Esko in Ghana, SIMA inMozambique etc..
- *Commercialization of agricultural products and connection to the market:* one of the main problems faced by farmers has to do with the difficulty of finding sustainable markets for the sale of agricultural products. The web pages provide opportunities for the promotion of agricultural products, comparison of prices, and the opportunity to link farmers with various intermediaries or selling the product directly to the final consumer [6]. ICT can be used to create financial facility (payment) and to enable the farmers to become part of the value chain Agrinet in Uganda, M-PESA in Kenya [6]. In traditional

systems of distribution channels there is often lack of information between parties, the exchange of information is incomplete, in one direction and not in real time. While through the use of ICT we have a two-way flow of information enabling the full communication in this way and in real time between the parties.




From the literature review, it is shown that the use of information and communication technology has improved the productivity and efficiency of farming especially in developing countries, where agriculture plays a key role in the economy of these countries. Technological advancements have made it possible for these systems to be used in developing countries, as the cost for the implementation of such systems has been significantly reduced. Moreover their use is very simple, making it possible and easy to use by each farmer.

## III. OVERALL PERSPECTIVE OF AGRICULTURE IN VLORË DISTRICT

Agriculture plays a key role in the economy of developing countries such as Albania. The role of agriculture becomes even more important in developing countries such as Albania, as agriculture affects the gross domestic product and the level of employment in these countries. In Albania, the agricultural sector is one of the most imortant areas of economy and it contributes with 20% to GDP and roughly 50% of employees belong to this division. However, most small and average farms are mostlyinefficient and find it difficult to be competitive in the global market. Low level of mechanization and the fact that a lot of working process is still done by hand leads to low productivity of farms. At the end of 90s and the following 25 years the reform in the agricultural land has affected the efficiency of thissector. This is because this resulted in extreme fragmentation of farm land and numerous ownership conflicts which hinder the trade of agricultural land or any possible cooperation. In this paper we will focus on the analysis of Vlora region's agricultural sector, and will try to give suggestions on how to use the information technology systems in this region. Vlore County has an area of 148 000 ha plantation area, and from year to year walnut tree planted area has increased [7].

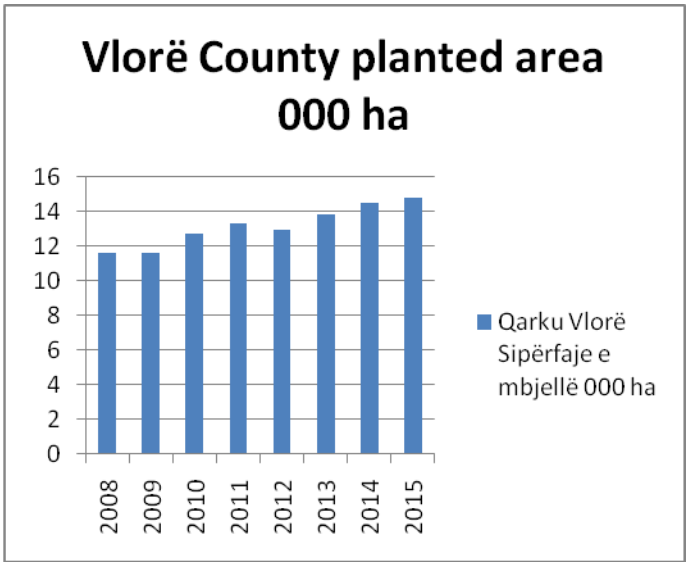



**Figure 1** Planted area in Vlore County. Source: INSTAT(statistics institution)

An important part on agricultural products is played by fresh vegetable production (35 3339) for 2015) the bulk of which are destined for consumption of the domestic market. Melon products for 2015 amounted to 10,718 tons, yet the product in many other cultures is still very low.

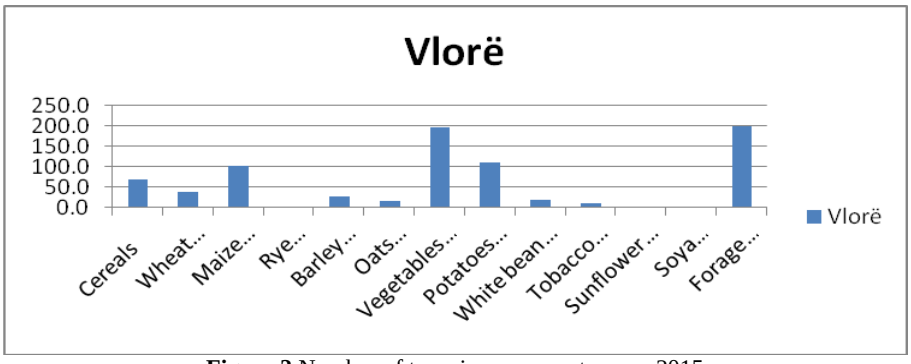



**Figure 2** Number of trees in permanent crops, 2015

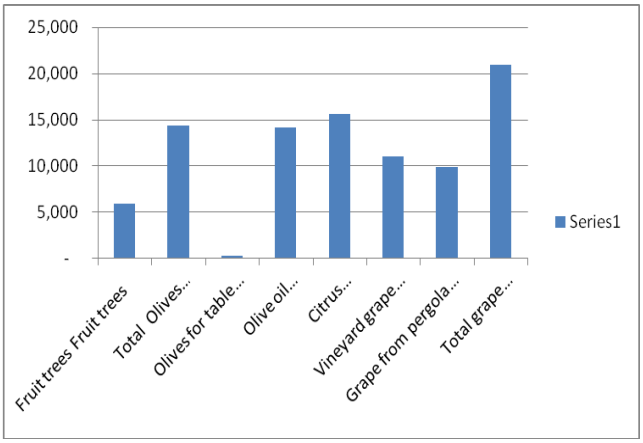



**Figure 3** Production of permanent crops, 2015(ton)

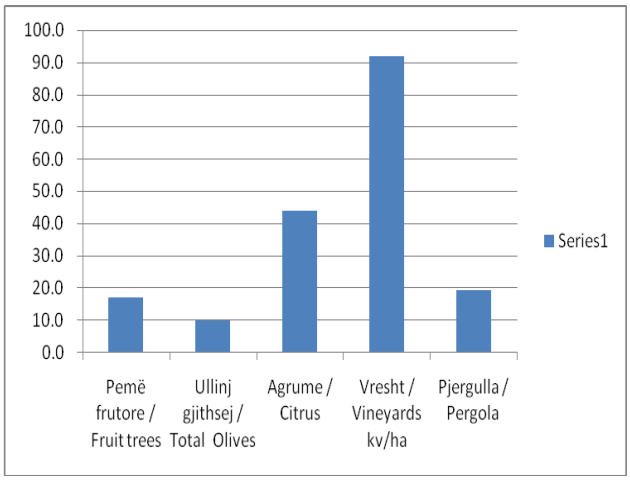



**Figure 4** Yield of permanent crops, 2015 (kg/unit)

Farms of Vlora under survey, despite the efforts continue to be not competitive in the market, due to the low productivity, lack of sustainable markets, lack of branding and marketing of agricultural products, low level of mechanization of labor, using old methods in the production process, etc. Therefore Albania's agricultural system needs change to in order to have an increase in the efficiency and competitiveness. An opportunity to overcome some of these problems for Albanian farmers is the use of information and technology systems.

## IV. THE USE OF ICT IN ALBANIAN FARMS

In Albania in recent years, farmers have begun to give special attention and interest to the agricultural sector as one of the most important branches of the economy..However, it is noticed that Albanian farmers have not started to use ICT in their farms, yet. Interest for Albanian agricultural products has gradually increased, however, limited budgets and lack of adequate promotion of products makes it difficult to find stable markets for farmers. Even domestic consumers often have difficulty in finding information in local agricultural products. Under these conditions, despite the fact that Albanian products are of high quality and can truly compete in international markets, most of them fail to leave the region in which they are produced. Therefore, Albanian farms strive for their survival, do not get high profits and are not efficient.

We take the first steps towards the application of ICT in the Albanian farms by building a web application through which the marketing and advertising of agricultural products will be enabled. The web will help the farmer to get connection to local and international customer. This web will perform several functions starting with the promotion of products, enabling direct contact between farmers and distributors. It will also provide data on the characteristics of products to consumers thereby reducing the consumer perceived risk. This web also creates an opportunity for creating a database whose data can be used by farmers, distributors, customers or policymakers. For instance, through the data obtained from the web, the system of grants can be improved in Albania. The use of this web will bring innovation and enable increasing efficiency and effectiveness of the Albanian farms. Albanian agricultural products, which so far have been isolated and less popular in international markets, through the web will be promoted in all targeted markets with a minimal cost for the farmer.

The sooner this connection between ICT and the Albanian farmer is made the earlier the advancement of the qualitative development of the agricultural system in Albania, because the low cost of today ICT systems makes their eventual implementation possible in a very quick and short time.

## V. SYSTEM USE AND ITS STRUCTURE

A summary of the system use and its structure will be presented in this section. The system use is as it follows:

• Every visitor of this web application has the possibility to create accounts.
• The manager user imports / changes / deletes products, product categories and plantations
• Each farmer may have one or more fields.
• Each field produces a product.
• In a "measurement" table the average moisture and temperature measurement of the field recorded on a day can be found.
• The main programming language is *php*.
• The design is based on a template.
• Design based on a template
• The screens design is based on *HTML5 and CSS3*language.
• The database used is *my sql* and its usage area is *my php admin*.
• Its design was set up with the waterfall model.
• Each customer can buy products and see the name of the farmer and the location of product.
• Purchases, farmers' records, records of customers, products are stored in a database (any action that occurs between the client and the farmer to purchase products is recorded in the database)

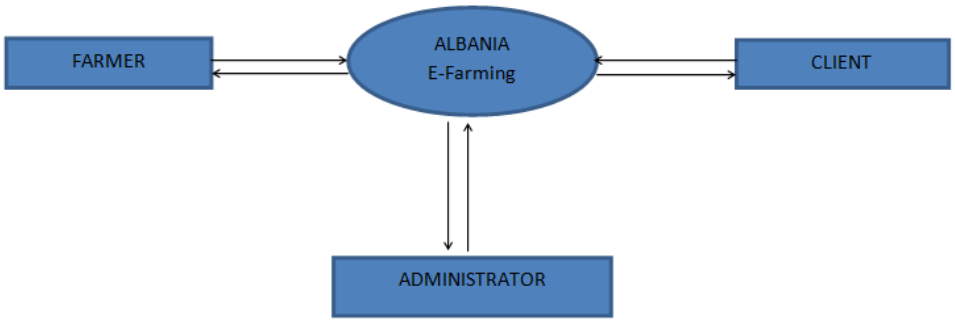



**Figure 5** The system structure

[1]. **Architecture of the system screen**

The main main screens of the system appear is shown in Fig. 6 Each screen conists of the “header” where the daily offer appears and the menu Login/Register/Contact. From the selection menu where the various product categories are, the search button and the purchase basket. There is also a breadcump chapter,footer and main part of the page. For this application design technologies css, html5, bootstrapwere used, as well as a template obaju frombootstrapious.

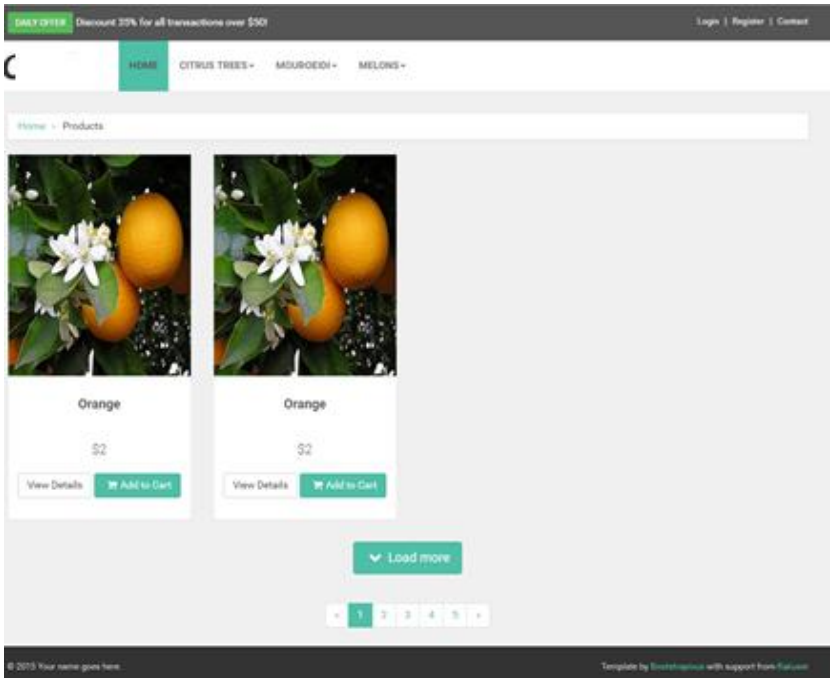



**Figure 6** The main main screens

## Use scenarios

[1]. **User's registration**

Data filling and "Register" button selection.is shown in Fig. 7

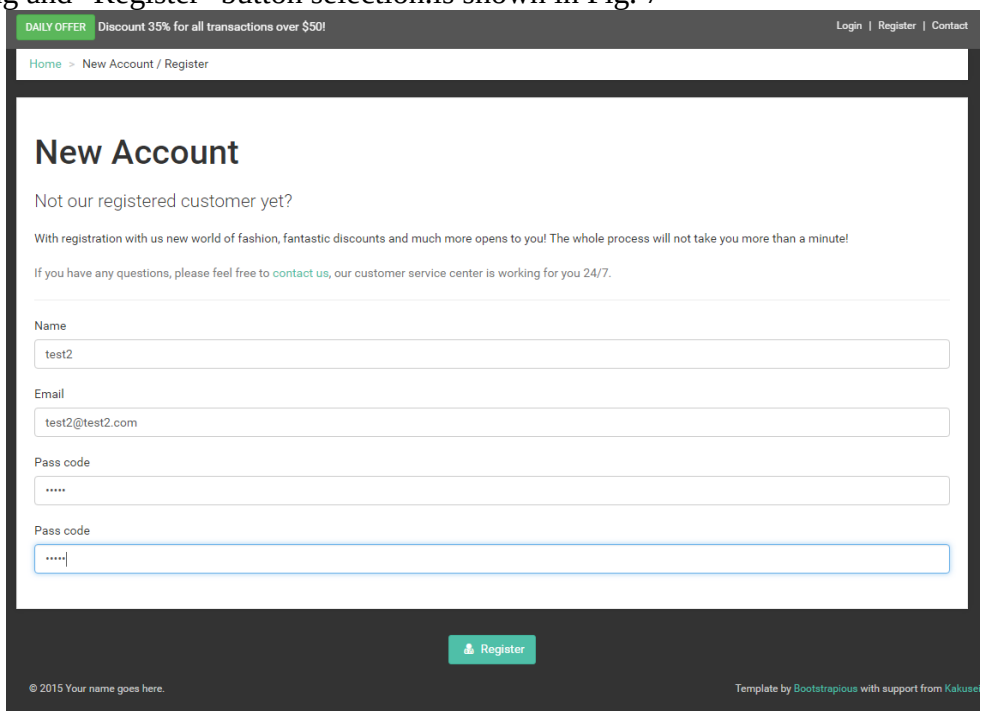



**Figure 7** Registration form

When the registration is done a new registration is added to the dadatabase(Fig. 8)

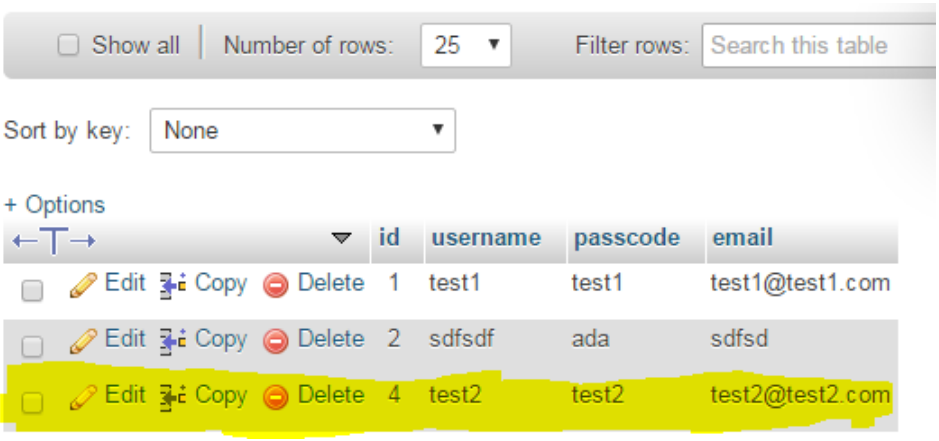



**Figure 8** New user

## VI. CONCLUSIONS

Agriculture is a vital sector of our country economy, but most of the farms are inefficient due to high management costs and outdated technology used. In this paper we propose that through the use of ICT Albanian farms may be more efficient on the market. The technology used in this web application _ Main programming language is php. The design is based on a template. The screens projection is based on HTML5 and CSS3 language. The database used is my SQL and its area use is my PHP admin.The design was set up with the waterfall model. The main advantages of the system proposed by us are based on the web's multifunctioning, as the web enables product promotion, information, mediation, online product sales, data collection etc. Apart from the multi functioning, the application of this system has a very low cost and is easy to use.

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