



Nr.4, Viti 2015

# NATIONAL FARMERS REGISTRY SYSTEM IN SUPPORTING AGRICULTURAL SUBSIDIES IN KOSOVO

### Besim AJVAZI<sup>1</sup>

### SUMMARY

The main goal of this paper is to introduce the importance and the ways of development of a national farmer's registry system in supporting the subsidy process in Kosovo. Herein, in detail is described the necessity to create such a system, the methodology of registration, system architecture, analysis of existing data and finally a proposal for potential further extension of this system.

Based on the need for continued support of the agriculture sector, since 2010 the Government of Kosovo started to support the farmers through agricultural subsidies. However, the implementation of this process requires a precise identification of the number of farmers and their farm type that they possess. Therefore, the farmer registration initially started in order to identify the number of those who possess different farms in the country, and also a preliminary planning of the state budget necessary for the implementation of the subsidy system.

This paper examines how the farmers register system has been developed which enables a better and a more efficient management of this process. In addition to this review, a conclusion is provided with some recommendations for further development in this field with special attention to integrate the spatial component as well.

Key words: registry, agriculture, farmers, subsidy, spatial component.

## 1. INTRODUCTION

Registration is generally defined as "the action by which a person or thing is given an identifying number and recorded in a register" (Guillen and Vincent, 1990:261), thereby publicly establishing the rights concerned. But we need to recognise that registering farmers and farm land is not merely a technical operation. It has a key role to plan the future and make best policies in agriculture sector.

<sup>&</sup>lt;sup>1</sup> **MSc. Besim AJVAZI**, besim.ajvazi@uni-pr.edu Geodesy Department; University of Prishtina; Prishtina, Kosova. www.uni-pr.edu



No.4, Year 2015



Farmers Registry represents a unique system used to record the identity of each farmer who submits an application for agricultural assistance. In Kosovo, law requires that before applying for direct payments or rural development funds, the farmer is required to register in Farmers Registry, who then takes a unique identification number (INF). The main purpose of the unique identification is to avoid double declaration by the same farmer. Development of national farmer registry for Kosovo involves the data collection about individual farmer and farm agriculture activities carried out by the farmer. Information collected through the Farmers Registry aims to help the Ministry of Agriculture in making the right decisions about policies, strategies and programs aimed at supporting the agricultural sector. This will support decision making and will have an impact in economic development of the country. Therefore, the collection of such information should be done in a harmonized level, and thus the statistical standards and classification by the Statistical Office of Kosovo and EUROSTAT to apply for the purpose of establishing the National Farmers Registry.

For each registered farmer, the system collects and stores data in digital form as follows:

- 1. Data on the farmer and the farm (the legal status of the farmer, the farmer's personal data; and personal identification and password to access on web application sLPIS (Land Parcel Identification Parcel); contact details; farmer residence expressed by its geographic location, bank details.
- 2. Statistical data on the farm (farmland in hectares, divided into land owned and leased; Information on specific agricultural activities related to land use, type and number of animal's and machinery).
- 3. Approval information (place and date of signature to confirm that the farmer has signed it).

After completing the registration process, the farmer will be provided with a certificate. This certificate / document one page proves that the farmer was successfully registered in electronic farmers registry (eFR) system, and it contains the identity card (ID) unique identification number of farmer (INF). This certificate can be generated only by the application via the Internet (web eFR).

# 2. SYSTEM ARCHITECTURE

Existing data and those which are created through the process of registration of farmers are modeled in the framework of a unified database to



#### Nr.4, Viti 2015

MMM

Geo Information

PostgreSQL. Development of a national system for registry of farmers is done in Java following the standards required for Web Feature Service (WFS). Part of the presentation was developed using technologies HTMP5, jQuery, Open Layers. Such a system enables an easy management of the farmers registry, view, edit and archiving of data for the farmer and his farm. This system offers multifunctional functions and use as well, such as easy access to all users from the central and local government on the basis of previously defined roles (Figure 1).

The system is divided into four main blocks (Ghitesu, 2012):

- Homepage
- eFR search data, personal data of farmers and availability, statistical data on land use and livestock on the farm.
- Statistics this displays the basic statistics, for example land area between 0.5 ha to 1 ha within one municipality based on legal owner and current user as well.
- Administration management of the system (users, roles and privileges, banks, municipalities, archiving, etc.).



Figure 1 Electronic farmer registry system (home page)

Data management through electronic farmer registry system in based on the following functions (Ghitesu, 2012):

• Search tool, which enables search for data that exist in database



### No.4, Year 2015



Geo Information

 Creation. Editing and printing of data enable the creation of a new farmer, changing existing data on the farmer or his farm, and printing data for farmers that are represented in a certificate which is identified based on the unique number of the farmer.

Advantages of using this system are as follows:

- Quick and intelligent system management, control and data management.
- Possibility of connecting with other GIS applications.
- Provides results and statistics in real time.

# 2.1 The role of users

Electronic farmers registry system is a web based platform system which is designated to the integrated management of data on farmers. The application is developed according to the standards required by the European Union, simple to use, functional, safe and practical. This application offers a better data management related to farmers of the Republic of Kosovo.

The following users have the right to access the application:

- Administrator
- Official from ministry of agriculture
- Official from municipality
- Official from statistics sector (ministry of agriculture)

eFR is a unique system which makes the identification of users in order to enable data registration only by authorized persons. Each user must use application with his personal name as a user and password. Because the password and username are personalized, it is not possible to be used by any other user. If a new user must work with the application, first of all he must request a new username and password from the Ministry administrator. Users are created with different rights to access. Administrator assigns roles and privileges for access to all users. In the table below the relevant user privileges of the system are shown.

Function	Municipal official Ministry official		
Search	Search for all data	Search for all data	
Create	Only for his municipal, one user is	For the whole territory of	
	connected to only one municipal	Kosovo	
Edit	Only for his municipal, he cannot	Available for all data,	
	delete any of Farmers	included deleting a farmer	
Print	Only for farmers from his	Available for farmers for the	
	municipality	whole territory of Kosovo	
Statistics	Only for his municipal	Available for all data	

Table 1. Functions permitted





Nr.4, Viti 2015

Regarding the users of the Ministry of Agriculture in the role of official statistics, he has the right to see all the statistics that result from integrated data into the system.

## 3. DATABASE DESIGN

The first step in designing a database was a requirement analysis - in other words, finding out what's needed, and working out the best way to deliver a system that fulfills those needs. Getting the data-model right is always an iterative process - an initial draft data model will be sketched out by one team member and then passed around for peer review. Issues that arise from the database design process will feed into the overall system design; queries that get answered here may throw up questions that need to be addressed elsewhere.

Database schema is designed as follows (Figure 2.1):

- Data on farmer
  - Identification Data
  - Bank Data Bank
  - Data on farm
    - Data on the geographic location
  - Data on land
  - Data on animals that possess
  - o Data on machinery that owns
- Data for archiving of operations such as creating, editing, deleting, (who, when, where)
- Data for system administration
  - o Users
  - o Roles
  - Privileges
  - o Municipalities







Figure 2.1 Database schema

## 3.1 The existing data analysis

Prior to the development of eFR system, municipalities and the Ministry of Agriculture have used a primitive system for recording the data. This data have to be migrated in eFR system. Nevertheless, initially we had to make some analysis of these data with respect to possible errors that may contain. In this case it was necessary to develop the system in order to identify prospective errors such as multiplication of personal identification numbers, personal numbers with less than 10 numbers, registered farmer without the municipality, farmer with no account, farmer with a wrong account number (not 16 digit), etc (Figure 3.1). Records with errors as mentioned above are categorized by category A. Farmers that may have such errors can not take



#### Nr.4, Viti 2015



Geo Information

the certificate based on INF. But data will be stored in database and at any time when these errors will be corrected, than the system can generate INF and the farmer certificate. While data categorized as B mean that there is any mistake in declaring the land use, animals or machinery from the farmer. In this case the system will generate the INF but the farmer certificate can not be printed. So in both cases (category A and B) farmers can not apply for subsidies.

Search & Farmer Land use	Animals Mechanization Signature	Statie
I accept errors!     Fields with this co	our are required Not filing these fields, lieds to the A category of errors	+* Histo
Information about the Farmer!		admi 🖉
Individual person	Company	Rural
Number of Application	NIF	Direct
First name  • Farmer's name	e is empty! East name • Farmer's surname is empty!	• Direct
Fathers name • Farmer's Fat	er name is empty! • Farmer's birthdate is empty!	
Personal ID Farmer's per	onal number is emoty/ Death Date(dd.mm.yyyy)	
Farmers language Albanian	Password	
Active Yes		
Information about the Farm		
Municipality Rahovec	Village     Village is empty!	
Street	House No.	
Post code	Formail	
Coord 1	Coord 2	
Coord. 1 is empty!	Coord 2 is empty!	
Bank		
Name of the Bank	Bank account number Delete	
Bank name is mis	ing! • Bank account number is missing!	
Status :Edit mode (Farmer with personal ID:	🕄 Cancel 🔠 Save	
HOME EFR STATISTICS ADMINISTARTION	HISTORY ABOUT US CONTACT @2013 Geo&Land sh.p.k. All rights reserved	
c	olokto statusin	
	•	
Т	ë gjitha	
G	abime me kat. A & B 📃	
G	abim nme kat. A 📃	
G	abim me kat. B 📃	

Figure 3.1 Registered data with errors





## 4. METHODOLOGY OF FARMERS REGISTRATION

The registration was carried out in 2013. During that time a subsidy campaign was opened. This process was implemented by municipal employees.

The whole process of farmer registration goes through in following stages (Figure 4.1):

- Open the farmer tab will be registered data on farmers as a natural or legal person as well as data on his farm.
- Open the farm tab will be registered data related to agriculture land, divided if land area is owned or is rented.
- Open the animals tab will be registered data related to animals that the farmer possess.
- Open the machinery tab will be registered data related to the mechanism of the farmer.
- Open the approving tab will be registered data related the farmer's name and applying date for registration.

Kërko	🚨 Fermeri	Toka në shfrytëzim	Kafshët	Mekanizimi	Nënshkrimi	
NIF [		Nr. personal		Kërkimi i de	tajuar 🗖	

Figure 4.1 Open new tab for farmer

### 4.1 Interconnection between eFR and sLPIS

For the management of agricultural subsidies, information on farmers and farmland in Kosovo is registered in the National Farmers Registry system. However, the system in itself currently does not offer the possibility to integrate spatial data. But this issue has been solved, because during the development process of this system is enabled interconnection between this and Land Parcel Identification System.

"LPIS" stands for Land Parcel Identification System. To explain the basic concept of LPIS it is helpful to raise the following question: When is LPIS useful or necessary?" The answer is quite simple. LPIS is useful or necessary



#### Nr.4, Viti 2015



Geo Information

in cases where you wish or you have to know, who uses, where, which land (Goertz, Nordin, 2012).

Who uses?

- Farmer, because LPIS is dealing with agriculture subsidies for farmers
- LPIS is interested in farmers using land
- No interest in the owner of the land since the recipient of payments is land user

Where?

- In which region, municipality and village the land is located
- Exact geographic location is required
- You need to be able to find it in the field
- Unique identification of the land

Which land?

- Utilized agriculture area
- Size of the land
- Land use category (arable land, grassland, permanent crops) and/or crop group
- Actual use of the area (crops, meadows, pastures, not in production agri-environmental area)
- Less featured area
- Specific other conditions (organic farming etc.)

The direct payment to farmers as part of the subsidies process is introduced in 1992 as a result of the so called Mc Sharry reform of the Common Agricultural Policy of the EU to compensate farmers for the decrease of guaranteed prices of the main agricultural products (plant and animal products). The implementation of such process is not possible without a prior registration of farmers and their farms. However, taking into account the fact that agricultural land contains spatial information in itself and without a geographical location is not possible to finalize the process of registration. As it was mentioned above the electronic farmer registry system is not designed to enable the identification of spatial location in relation to the farmer and his farm. But in Kosovo there is a system (sLPIS) which enables the identification of the geographical location of the farmer and his farm. Based on this, farmers registry system is designed to enable the connection with sLPIS and during the process of data entry for a new farmer, we can determine the geographic location of his residence and farmland.

Hence, LPIS is necessary and useful if you wish to know, which type of agricultural land a farmer is currently using. Moreover, you need



### No.4, Year 2015

MMM

Geo Information

information about the precise geographic location of the agricultural land including the exact size of the area. Finally, it is required to uniquely identify the agricultural land (Goertz, Nordin, 2012). All this information is needed for the application of area-related payments:

- Is the land existing?
- Is the size correct?
- Have two farmers declared the same land?
- Is the farmer really the land user?
- Is it really an agriculture land?

## 4.2 Practical implementation

During the registration process of farmers, an important data that has to be integrated is defining the geographical location of residence of the farmer and his farm. Therefore, being by the window of entry information for the farmer, in the part of the data on farm, connect automatically with sLPIS and determine the geographic location of the farmer.

Current version of sLPIS includes following functions:

- Zoom on map
- Pan on map
- Reload the map
- Measure the distance
- Insert vector data
- Export image of map

Data that are integrated in sLPIS are municipal cadastral borders and ortho images. This will help in finding and defining the location of the farmer and his farm as well.

To add coordinates in eFR system should be taken the following steps:

• We should zoom the map (Figure 4.2) in order to be able to locate the exact position of the farm, activate coordinate tab (+) and click on the map. Coordinates where you clicked on the map will appear in the left corner under map framework and automatically will be transferred to the eFR application (Figure 4.3). In case of exist coordinates entered in the application of eFR these coordinates are rewritten.







Figure 4.2 sLPIS opened and zoomed to relevant Municipality



Figure 4.3 Coordinates tab is activated and in map we have clicked to define the farmer location



#### No.4, Year 2015

MMM

Geo Information

- In order to store the coordinates in sLPIS as well, we should open the window of eFR (and not to close the sLPIS) to store other data for the farmer and we just save changes. Then the coordinates of the farmer location will be refreshed in sLPIS.
- If we want to check if location of the farmer is correct, we should open the window of sLPIS and click the tab reload
   Map will be refreshed and we can see a symbol that indicates the location of the farmer and his name as well (Figure 4.4).



Figure 4.4 Location of the farmer

Similar procedure will happen if we want to identify the location and area of a farmland.

# 5. CONCLUSIONS AND FUTURE WORK

National farmer registry system is very helpful in terms of possibilities that it offers in subsidy process for Kosovo. The lack of such a system, where data are not stored centrally, information are not displayed in unique form among central and local institutions the implementation of the subsidy process will be limited and harder to manage.

However, knowing that the implementation of a subsidy campaign include certain processes, we can conclude that the current system should be improved and extended with other functions as well. In terms of the overall functionality I would recommend that the current system to be expanded



#### Nr.4, Viti 2015



Geo Information

with two additional modules, that of direct payments and other one with rural development through grants providing by state government. The development of these two modules can provide an expanded opportunity for municipal officials who implement the subsidy campaign, because it will control the process in details.

While in terms of geospatial information what needs to supply this system, it is important to note that is very necessary to develop an additional module that will enable displaying spatial data about the farmer and his farm. As it was introduced in the paper, such information currently is taken by the connection with sLPIS. Though the current system of sLPIS does not provide enough features for a better management of this process. Therefore I would recommend that the current version of eFR to be developed with spatial component as well.

Further development of the system aiming at including spatial component and GIS functions, besides others would have to solve main issues as follows:

- ✓ To allow the declarations in relation to agricultural land be made on annual basis and within the polygon/range to be created or is created previously. It should enable the management of transactions for certain area, leasing and cadastral parcels connection. If this would happen, then we can know exactly the previous situation of a respective area.
- ✓ Knowing the initial registration of the farmer is made according to his declarations, but then municipal officials will conduct inspections in most of registered farms and sometimes it happens to identify irresponsible farmers who declare not right about their land agriculture. Current legislation in Kosovo for such farmers foresees punishment. But eFR system in such cases enables only the identification of the farmer who has pleaded not straight but not the spatial identification of the location / his farm. Inclusion of spatial component will enable the identification of the respective farm area, and not only the farmer.

As a final conclusion, further development of system based on Web GIS methodology would facilitate the subsidy process in Kosovo, and would prevent eventual misuses.



#### No.4, Year 2015



## 6. **REFERENCES**

- 1. Ghitesu, R. (2012): eFR User Manual, Kosovo
- 2. Goertz, D Nordin, N. (2012): Master plan for Implementation of the Land Parcel Identification System (LPIS) in Kosovo
- 3. Guillen, R. Vincent J., (1990). Lexique des termes juridiques, 8ème éd., Paris, Dalloz.
- 4. http://ec.europa.eu/agriculture/cap-history/1992reform/index\_en.htm
- 5. Ibrahim, I. H. Yomralioglu, T. Ulger, E.N. (2011): Evaluation of national farmers' registry data in geoinformation, Scientific Research and Essays, Vol 6: 422-429
- Kaloxylos, A. Eigenmann, R. Teye, F. Politopoulou, Z. Wolfert, S. – Shrank, C. - Dillinger M. - Lampropoulou, I. -Antoniou, E. - Pesonen, L. – Nicole, H. - Thomas, F. - Nancy Alonistioti, N. - George Kormentzas (2012): Computers and Electronics in Agriculture 89: 130-144
- Sagris, V. Devos, W. Kay, S. (2008): LPIS Core Conceptual Model: Methodology for Feature Catalogue and Application Schema, Ispra (VA), Italy
- 8. Sagris, V. (2009): Conformance test for LPIS Core Model, Ispra (VA), Italy
- 9. Wismans, W.M.G (1999): Identification and registration of animals in the European Union, Elsevier Computers and Electronics in Agriculture 24: 99–108