

**MINISTRY OF FOOD, AGRICULTURE AND LIVESTOCK  
AGRICULTURAL REFORM GENERAL DIRECTORATE  
CONTROL/CONFIRMATION SCREEN OF GEOGRAPHIC  
INFORMATION SYSTEMS APPLICATION**

**Aygün İREM YAVUZ, Türkiye, Dr. İsmail HAKAN ERDEN Türkiye, GÜLŞEN ÖZTÜRK Türkiye**

**Key words:** Agriculture, gis, control, quality

**SUMMARY** Agriculture Information System of The Ministry which is used for management of agricultural support and determine our country's agricultural fields has also internet-based geographic information system (GIS) application which use the cadastral parcels and the images of the field for creating agricultural parcels. The concept of agricultural parcels, is agricultural production within the boundaries of the cadastral parcel.

This software that is use for creating agricultural parcels is like a desktop GIS programme which has a variety of arrangements, and also it is possible to use the images as a base map.

Agricultural parcel arrangements may be caused by changes in cadastral parcels or by differences in agricultural use on the image.

The personnel in charge of the geographical information system in 81 provinces can use this open source code software with a password anywhere on the internet. Also this software has a control/confirmation screen that Ministry staff in the offices of the provinces, can check the quality of the agricultural parcel edits for their province which are made by the operators on a non-live environment, with the control/confirmation screen. If any province reaches the expected accuracy rate of agricultural parcels arranged in non-living environment, it is activated in live environment. At the same time, the arrangements for the agricultural parcels are still being carried out by the provincial directorates of the Ministry as soon as they are deemed necessary, and no arrangements are made by the operators unless there are no errors in the parcels that are arranged by the staff in charge.

Weighting of the shares of total accuracy by importance level by rating position-attribute-cut / split operations on parcel basis on the control screen, random selection of the parcels, focusing on the screen to be controlled parcel, bringing different parcels into the screen in each control list to be created, automatic calculation of accuracy calculations, the control by provincial directorates can be controlled by the center has provided.

In this respect, the protection of the update of our country's agricultural land, besides the additions of fertilizers to be fertilized the personnel assigned to the provincial directorates are also allowed to serve as quality control units. Verification of the applications of our farmers for their agricultural support is made possible by showing the changes that are taking place in the agricultural parcels and giving support to the correct area.

In this study, the control / confirmation screens and working principles will be detailed.

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**1. CONSTRUCTION OF AGRICULTURAL PARTS**

The cadastral parcel that shows the location of the title documents on the ground of the property is used as the base so that the agricultural areas can be identified and the agricultural payments to the producers can be made through these fields. The parts which are considered to be arable land that can be produced within the cadastral parcel borders are called agricultural parcels.

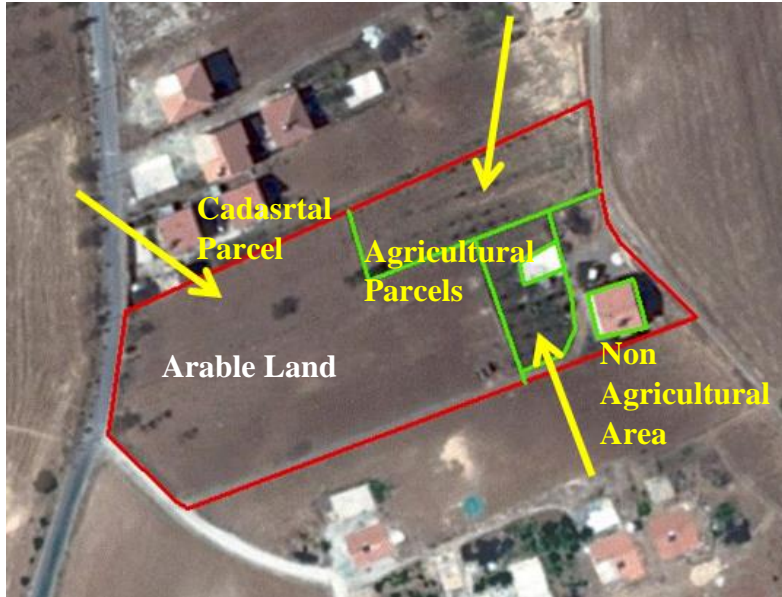


Fig.1 Extraction of non-agricultural area within the cadastral parcels and segregation by arable land

In this context, all the cadastral parcels are checked in the country basis and the areas which are not able to be farmed such as buildings, rocky, stony areas, large tree communities, lakes, ponds, dams, canals and pools over 100 square meters within the parcel borders, road areas over 3 meter are removed and arable lands are obtained and these areas are called agricultural land plots. For areas that can not be farmed under the values determined as this criterion, it is stated that the attribute information of the parcel is an element other than the criterion within the agricultural area.



system before being taken under control and will not effectively affect the existing system unless approved.

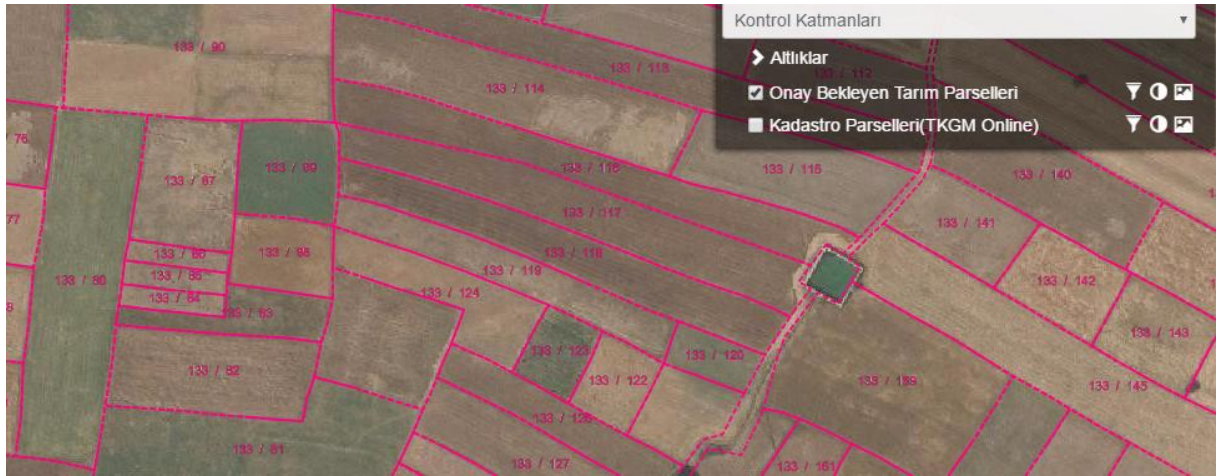


Fig.4 Control Layers

For the province in which the study is completed, the authority definition is made within the specified time period in order to be able to create and access the provincial control lists on the system for the personnel defined as responsible for the geographical information systems on the ground.

Fig.5 Defining Control Authority in Date Range

### 3. CONTROL SCREENS

The generated validation screen is used as a random selection of agricultural parcels arranged through the system. The positional accuracy is 0.50, the attribute and shear split accuracy are weighted to 0.25 points.

#	İl	Kontrol Oranı	Doğruluk Oranı	Başarılı Mı ?	Kilitli Mi?
> 1	ADANA	%100	%97.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 2	ADIYAMAN	%100	%97.12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 3	AĞRI	%100	%98.62	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 4	AKSARAY	%100	%99.23	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 5	AMASYA	%100	%94.27	<input type="checkbox"/>	<input checked="" type="checkbox"/>
> 6	ANKARA	%100	%98.31	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 7	ARDAHAN	%100	%97.8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 8	ARTVİN	%100	%95.25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 9	BARTIN	%100	%96.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
> 10	BATMAN	%100	%97.58	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Fig.6 Provincial Check List

The number of parcels to be brought on the control screen is determined by the ISO standards according to the agricultural parcel numbers.

If number of agricultural parcels edited is between;

0 – 200.000 than 1000

200.001 – 400.000 than 1500

400.001 – 600.000 than 2000

600.001 – 800.000 than 2500

800.001 – 1.000.000 than 3000

1.000.00 and over than 3500 parcel are listed for the control.

#	İlçe	Kontrol Oranı	Doğruluk Oranı	
1	ÇAYIROVA	%100	%100	Parseller
2	KARAMÜRSEL	%0	%0	Parseller
3	İZMİT	%99.54	%97.02	Parseller
4	KARTEPE	%0	%0	Parseller
5	GÖLCÜK	%0	%0	Parseller
6	DARICA	%0	%0	Parseller
7	KANDIRA	%0	%0	Parseller
8	BAŞİSKELE	%0	%0	Parseller
9	DERİNCE	%0	%0	Parseller
10	KÖRFEZ	%0	%0	Parseller

Fig.7 Province control list by districts

For the checks to be carried out in accordance with these numbers, error rates are calculated on the system by collecting error points separately for each criterion in each parcel.

If error score is;

More than 50 on 1000 parcels

More than 75 in 1500 parcels

More than 100 on 2000 parcels

More than 125 on 2000 parcels

More than 150 on 3000 parcels

More than 175 on 3500 parcels

The work done in these cities will not approved. Also these calculation based on ISO standards too.

On the control screens, the parcels that come with random selection are created in a way that will come to the different parcel control screens each time a new list is created, so that a fair check is aimed.

il Kontrol - Parseller

Kaydet Listeyi Kilitle

Sorgulama Kriterleri

#	İlçe	Mahalle	Ada / Parsel	Konum Doğru Mu?	Öznitelikler Doğru Mu?	Kesme / Bölme Doğru Mu?	
1	KAHTA	ADALI	0 / 102	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
2	KAHTA	ADALI	0 / 1063	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
3	KAHTA	ADALI	0 / 1078	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
4	KAHTA	ADALI	0 / 160	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
5	KAHTA	ADALI	0 / 1696	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	

Fig.8 Creating a new list for the same province and different parcels on each list

il Kontrol - Parseller

Kaydet Listeyi Kilitle

Sorgulama Kriterleri

#	İlçe	Mahalle	Ada / Parsel	Konum Doğru Mu?	Öznitelikler Doğru Mu?	Kesme / Bölme Doğru Mu?	
1	KAHTA	ADALI	0 / 1049	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
2	KAHTA	ADALI	0 / 123	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
3	KAHTA	ADALI	0 / 127	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
4	KAHTA	ADALI	0 / 1385	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
5	KAHTA	ADALI	0 / 1537	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	

Fig.9 New list with different parcels in the same location

il Kontrol - Parseller

Kaydet Listeyi Kilitle

> Sorgulama Kriterleri

#	İlçe	Mahalle	Ada / Parsel	Konum Doğru Mu?	Öznitellikler Doğru Mu?	Kesme / Bölme Doğru Mu?	
15	SAMSAT	YARIMBAĞ	0 / 208	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
16	SAMSAT	YARIMBAĞ	0 / 529	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
17	SAMSAT	YARIMBAĞ	0 / 563	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
18	SAMSAT	YARIMBAĞ	0 / 606	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	

Fig.10 Creating a new list for the same province and different parcels on each list

il Kontrol - Parseller

Kaydet Listeyi Kilitle

> Sorgulama Kriterleri

#	İlçe	Mahalle	Ada / Parsel	Konum Doğru Mu?	Öznitellikler Doğru Mu?	Kesme / Bölme Doğru Mu?	
15	SAMSAT	UZUNTEPE	0 / 145	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
16	SAMSAT	UZUNTEPE	0 / 43	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
17	SAMSAT	UZUNTEPE	0 / 516	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
18	SAMSAT	YARIMBAĞ	0 / 676	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	

Fig.11 New list with different parcels in the same location

In the list of the parcel list which is brought to the screen of the responsible of the geographical information systems in order of districts on the basis of districts, the screen is focused on the

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selected lot with one key. The total accuracy rate that is automatically calculated in the direction of the correct-false markings of the personnel who control the system is displayed on the control screen. Work details, accuracy rates and percentage of parcels checked by the staff of the province can be tracked by the center. Providing topology controls on the province's agricultural parcels system, which reaches the anticipated accuracy, is activated and integrated with other systems.

İ Kontrol - Parseller

Kaydet Listeyi Kilitle

Sorgulama Kriterleri

#	İlçe	Mahalle	Ada / Parsel	Konum Doğru Mu?	Öznitelikler Doğru Mu?	Kesme / Bölme Doğru Mu?		
1	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 205	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
2	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 220	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
3	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 326	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
4	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 328	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
5	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 329	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	
6	<input checked="" type="checkbox"/>	PAMUKOVA	AHILAR	0 / 355	<input checked="" type="radio"/> Evet	<input checked="" type="radio"/> Evet	<input checked="" type="radio"/> Evet <input type="radio"/> Hayır	

Fig.12 Parcel Lists

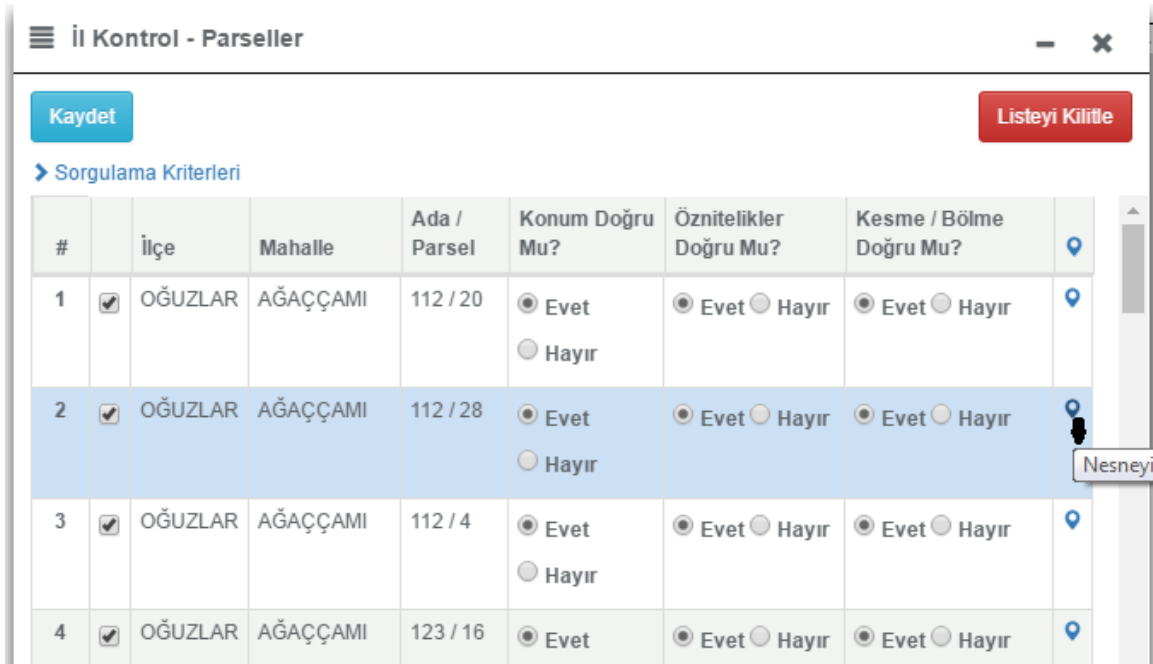


Fig.13 Adding selected parcel to the map

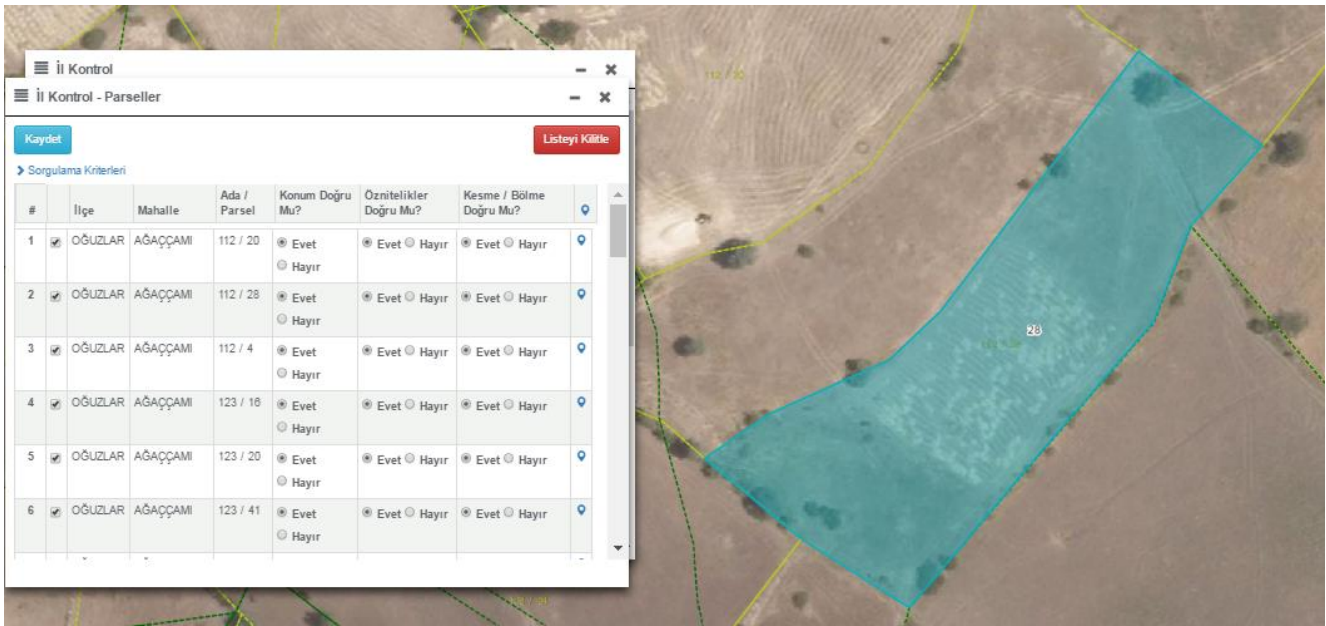


Fig.14 Screen focusing on selected parcel

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## CONCLUSION

With this study, the Ministry is able to access up-to-date arable land information that is compatible with the Land Parcel Identification System in all areas of cadastral and non-cadastral areas. It also acquires knowledge of non-agricultural areas within the cadastral borders and provides support payments to the right amount of space. Statistical information about cultivated, planted, greenhouse and mixed agriculture (a row of cultivated a row of stitches) is formed and is prepared for agricultural planning.

The technical staff working in the provincial directorates of the Ministry also gain control staff competence by carrying out an equivalent work on the work done by the external quality control experts in the projects of the European Union thanks to this screen and improve themselves in geographic information systems and remote sensing studies.

## REFERENCES

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## BIOGRAPHICAL NOTES

Aygün İrem YAVUZ

In 2009, author started to work as a Survey Engineer at the Ministry of Finance, General Directorate of National Real Estate in Kocaeli Province. Since 2012, author has been working as Survey Engineer in the General Directorate of Agriculture Reform in Ministry of Food, Agriculture and Livestock.

There are publications about; Ongoing Projects in Turkey in European Union of Food, Agriculture and Livestock Ministry of Operation Performed in the Land Parcel Identification System Project, Agriculture and Livestock Ministry of Operation Performed in the in Geographic Information Systems Module developed under the scope of Agricultural Information System.

Dr. İsmail Hakan ERDEN

The coauthor started to work as an agricultural engineer in Ziraat Bank (Agricultural Bank of Turkey) in 1984. After working as an engineer at various branches of the Bank, he worked as Chief Engineer and Vice President at the Bank General Directorate. Since 2002, he has been worked as the Engineer, Project Coordinator, Branch Manager and Head of Department and has been working as a Ministry Expert at the General Directorate of Agricultural Reform of the Ministry of Food, Agriculture and Livestock. There is a record to the Chamber of Agricultural Engineers professionally of the author who has membership to many organizations. In addition to these author has many publications about Integrated Management and Control System (IACS) also Carbon Stock Changes due to Land Use Conversions Between Croplands, Grasslands, Settlements and Wetlands in Turkey, Crop Production Yield Model, Agricultural Inventory Management System, Project-Based Application On Big Data Usage, Agriculture Information system, Efficiency Potential Provided By Increasing The Integration Level In Agricultural Information Systems And The Relevant Roadmap In Turkey, Knowledge,

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Document And Institutional Memory Improvement, Ongoing Projects in Turkey in European Union of Food, Agriculture and Livestock Ministry of Operation Performed in the Land Parcel Identification System Project, Agriculture and Livestock Ministry of Operation Performed in the in Geographic Information Systems Module developed under the scope of Agricultural Information System are the some of his publications too.

Gülşen ÖZTÜRK

In 1997, coauthor started to work as a teacher in the Ministry of National Education, and has been working as the Geological Engineer and Section Coordinator at the Ministry of Food, Agriculture and Livestock, Agricultural Reform General Directorate.

There are publications about; Ongoing Projects in Turkey in European Union of Food, Agriculture and Livestock Ministry of Operation Performed in the Land Parcel Identification System Project, Agriculture and Livestock Ministry of Operation Performed in the in Geographic Information Systems Module developed under the scope of Agricultural Information System Cost Efficient Mobile Device Based Field Verification Model For Permanent Crop Identification Via Satellite Images.

## CONTACT

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