THE ACTUAL DISTRIBUTION OF THE ARABLE LAND AND THE COMPARATIVE ANALISYS OF ITS DYNAMICS BETWEEN 1990-2015; CASE: DOLJ COUNTY (ROMANIA)

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Key words: agriculture, rural areas, stakeholders, Dolj county, Romania

ABSTRACT

The development perspective of the rural areas, in most of the cases, points out the agriculture as being the engine to trigger sustainable economic development of the respective territory.

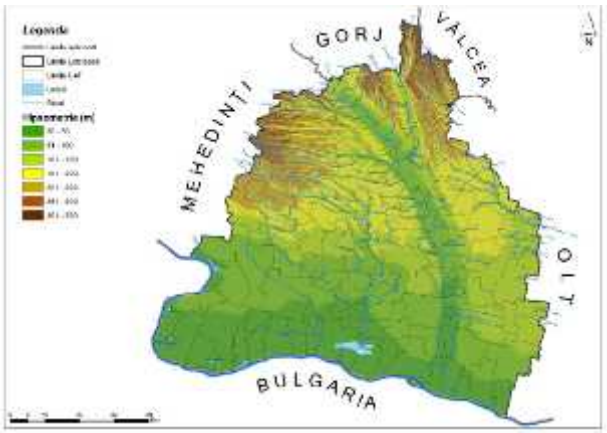
This analysis aims at identifying the elements which determine the development potential of the agriculture and of the rural areas, at highlighting, on one hand, the problems and the dysfunctionalities and, on the other hand, the development perspectives, the possibilities of increasing the performance in agriculture and the prioritisation of the necessary measures for both rural and agricultural development.

For the rural areas, the sustainable agriculture represents, nevertheless, the most efficient development measure.

INTRODUCTION

Dolj county is located in the South-West of Romania, between 43°43' and 44°42' North latitude, respectively 24°16' and 22°50' East longitude, being crossed, from the North to the South, by the Jiu river from which it was given the name (Doljiu – meaning „The lower Jiu".

The surface of Dolj county covers 742,175 ha. Presently, the agricultural land covers 585.072 ha, of which 487,601 ha is arable land (65.69%). Of the total agricultural land in the county, almost 18.11% is affected by flood risk, in particular the localities situated on the Danube meadow and the riverside of Jiu – lower basin.



In order to quantify all the land situated in the risk zones, the inventory of the agricultural land has been accomplished with the use of GIS techniques.

The present study has as a goal the quantification of the decrease in agricultural land in Dolj county (Romania) as a consequence of the increase, in the last years, in flood risk and urban development, namely by the expansion of the built-up areas.

MATERIAL AND METHOD

SOURCE OF DATA. Master plan of Dolj County, master plans of all basic administrative units, zonal urban plans, ortophotoplans, cadastral maps at different scale: 1:50.000 (1979) and 1:2.000 (1985), and map of exposed flood risk (conforming *Directive 2007/60/CE*). At the same time were used and other statistical data and information from agriculture registers and raports.

Regarding the methodology used for the preparation of the study, in order to obtain some conclusions, results and recommendations that reflect the reality of the territory, it

will use a mix of methods and techniques of analysis, based on the principle of "triangulation" for three types of methodological tools: Methods for gathering data/information; Methods of quantitative analysis; Instruments for qualitative analysis. For quantification of land surfaces, an inventory was made of the farmland using G.I.S. techniques (SIG).

METHODS. For achieving the present map and for a spatial analysis we used the soft ARCGIS 10.3.1 – Advanced Edition and the soft GeoMedia Professionals, working in the GIS environment.

The maps were built using the thematic layers and the imports of spatial objects, combined and integrated with the functionalities existing inside of the mentioned soft.

The interrogated and analyzed geospatial data are represented in a entire ensemble constituted from:

- Spatial data (having the coordinates in X,Y,Z, geografical and Cartesian coordinates);
- Descriptive data (non-graphic data – attributes) associated to geographical objects/phenomena (such streets, buildings, parcels).

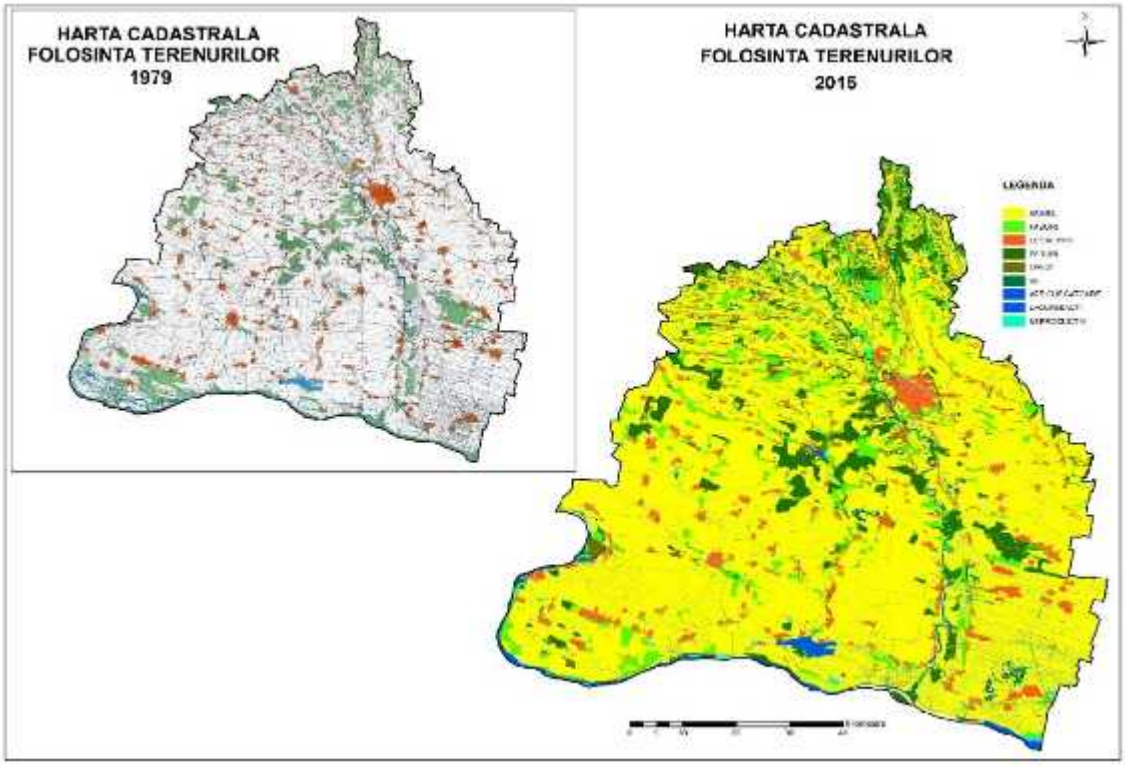
At the same time we used different functions for spatial analysis to identify the overlapping intra-urban and extra-urban land during the time. Other kind of functions were used to organise, design and presentation better the maps:

1. Analysis Tool->Overlay->Intersect
2. Analysis Tool->Overlay->Spatial Join
3. Convertion Tools->To Raster-> Ascii To Raster

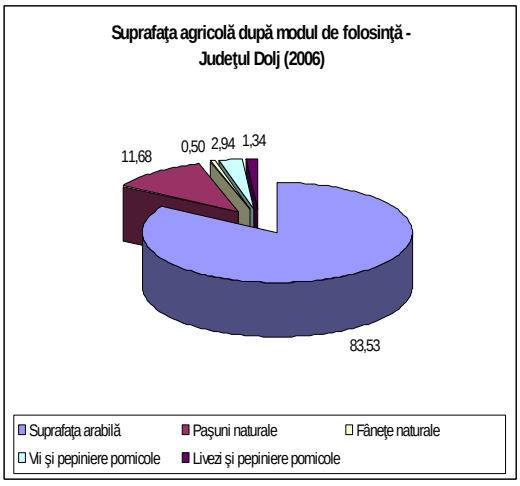
RESULTS AND DISCUSSION

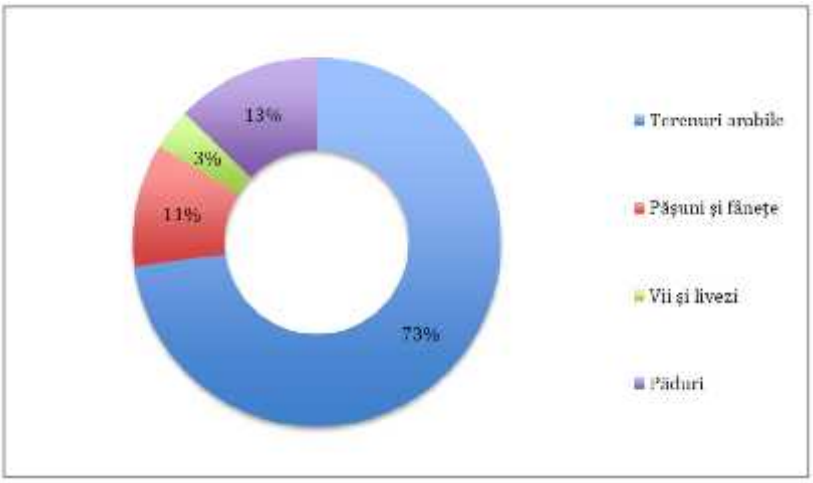
In this study analyzed a number of relevant documents in the context of the development of agriculture, in particular component "arable land" and the countryside for Dolj county during the entire period between 1990-2015.

As far as the use of the land is concerned, 78.9% of the territory of the county is agricultural land, and 21.1% non-agricultural land. As compared to 2007, the changes in the rate of use of the land are minor, consisting in the increase of the non- agricultural land area with 88 ha, in the detriment of the agricultural area. More precisely, the arable land decreased with 310 ha, 209 ha built-up areas, 166 ha communication networks, whilst the grass land and meadows extended with 105 ha, the vineyards and fruit gardens with 117 ha, the forests with 225 ha, the rivers and ponds with 67 ha, the degraded and non-productive lands with 171 ha.



THE CURRENT DISTRIBUTION OF ARABLE LAND



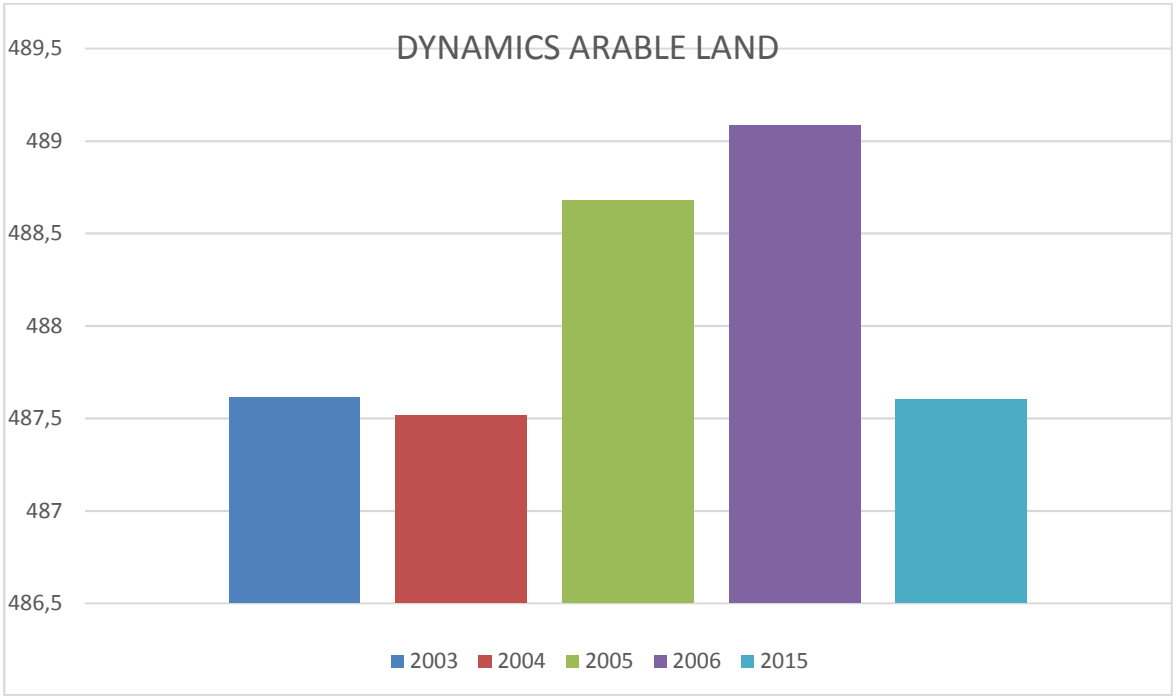


Sursa: INS, Judeţul Dolj în cifre 2003-2006. **Land utilization structure in Dolj county, on how the use of – 2011**

The distribution of agricultural land

Table 1

The agricultural area used by the method	2003	2004	2005	2006	2015
Agricultural area, of which:	585.736	585.759	585.699	585.515	583.069
Arable land	487.615	487.516	488.677	489.086	487.601
Natural grasslands	68.530	68.679	68.435	68.414	67.875
Meadows	2.952	2.952	2.952	2.952	2.952
Wine-growing and nurseries	18.287	18.260	17.538	17.188	16.946
Orchards and fruit tree nurseries	8.352	8.352	8.097	7.875	7.695



FACTORS THAT INFLUENCE THE AREAS OF AGRICULTURAL LAND

The aggressive urban development and the flood risk are key factors in the analysis of the dynamics of the agricultural land between 1990 and 2015.

A. Urban Aggressione

Analysis of dynamics of city land

Table 2

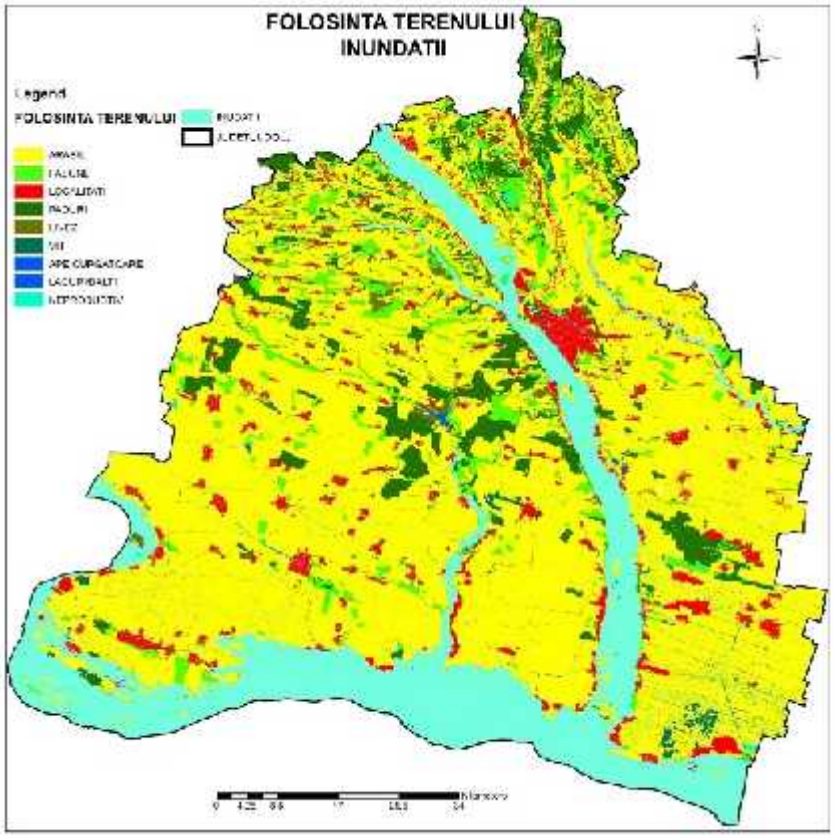
Nr. Crt	UAT	The commune' s area in the current version (OCPI)	Existing surface built in the year 1990 (ha)	Surface built in 2001 (ha)	Surface built in 2015 (ha)	Analysis of dynamic s of city land (ha)	Surface area in 1990 (ha)	Surface area in 2001 (ha)	Surface area in 2015 (ha)
1	CRAIOVA	8196.93	6036.80	7275.33	7275.33	1238.53	2160.13	921.60	921.60
2	BĂILEŞTI	16363.29	1197.46	1232.00	1232.00	34.54	15165.83	15131.29	15131.29
3	CALAFAT	13804.65	990.10	1054.80	1054.80	64.70	12814.55	12749.85	12749.85
1	BECHET	2926.67	399.86	411.45	518.50	118.64	2526.81	2515.22	2408.17
2	DĂBULENI	17951.41	861.61	919.85	950.00	88.39	17089.80	17031.56	17001.41
3	FILIAŞI	10007.86	911.70	971.05	971.05	59.35	9096.16	9036.81	9036.81
4	SEGARCEA	12001.75	421.00	502.00	663.97	242.97	11580.75	11499.75	11337.78
1	AFUMAŢI	6952.65	538.13	557.60	422.52	-115.61	6414.52	6395.05	6530.13
2	ALMĂJ	2749.64	667.88	680.00	594.85	-73.03	2081.76	2069.64	2154.79
3	AMĂRĂŞTII DE JOS	6220.85	723.35	723.35	723.35	0.00	5497.50	5497.50	5497.50
4	AMĂRĂŞTII DE SUS	3488.28	569.00	715.44	397.00	-172.00	2919.28	2772.84	3091.28
5	APELE VII	6476.91	270.50	266.83	284.60	14.10	6206.41	6210.08	6192.31
6	ARGETOAIA	8433.63	689.05	739.70	772.11	83.06	7744.58	7693.93	7661.52
7	BISTREŢ	12220.18	442.96	430.42	484.23	41.27	11777.22	11789.76	11735.95
8	BÂRCA	8825.24	201.40	384.00	363.60	162.20	8623.84	8441.24	8461.64
9	BOTOŞEŞTI-PAIA	3997.64	135.34	126.42	126.42	-8.92	3862.30	3871.22	3871.22
10	BRABOVA	7965.06	431.40	445.21	445.21	13.81	7533.66	7519.85	7519.85
11	BRĂDEŞTI	6339.24	495.32	385.61	385.61	-109.71	5843.92	5953.63	5953.63
12	BRALOŞTIŢA	4044.55	334.30	340.80	355.61	21.31	3710.25	3703.75	3688.94

13	BRATOVOEȘTI	6506.23	707.38	754.18	663.79	-43.59	5798.85	5752.05	5842.44
14	BREASTA	4428.45	308.73	332.40	486.15	177.42	4119.72	4096.05	3942.30
15	BUCOVĂT	8357.64	380.15	455.46	664.45	284.30	7977.49	7902.18	7693.19
16	BULZEȘTI	6274.43	454.44	439.19	487.12	32.68	5819.99	5835.24	5787.31
17	CALOPĂR	9217.43	386.50	405.70	486.09	99.59	8830.93	8811.73	8731.34
18	CARAULA	3591.43	194.50	211.74	211.74	17.24	3396.93	3379.69	3379.69
19	CARPEN	6268.10	377.90	369.63	414.04	36.14	5890.20	5898.47	5854.06
20	CASTRANOVA	6807.12	257.22	276.01	276.01	18.79	6549.90	6531.11	6531.11
21	CATANE*	4667.41	-	-	259.49	-	-	-	4407.92
22	CĂLĂRAȘI	8750.91	475.50	510.49	510.49	34.99	8275.41	8240.42	8240.42
23	CÂRCEA*	3252.23	-	-	1900.55	-	-	-	1351.68
24	CÂRNA*	8418.76	-	-	147.50	-	-	-	8271.26
25	CELARU	9524.93	842.66	744.78	871.22	28.56	8682.27	8780.15	8653.71
26	CERĂT	4192.88	292.80	316.63	379.15	86.35	3900.08	3876.25	3813.73
27	CERNĂTEȘTI	5735.47	341.56	344.24	344.24	2.68	5393.91	5391.23	5391.23
28	CETATE	8677.10	343.60	356.99	392.20	48.60	8333.50	8320.11	8284.90
29	CIOROIAȘI	4534.51	333.15	323.60	346.75	13.60	4201.36	4210.91	4187.76
30	CIUPERCENII NOI	10622.45	489.00	543.00	616.01	127.01	10133.45	10079.45	10006.44
31	COȘOVENI	4395.07	498.27	531.48	333.92	-164.35	3896.80	3863.59	4061.15
32	COȚOFENII DIN DOS	4556.90	256.51	279.70	338.06	81.55	4300.39	4277.20	4218.84
33	COȚOFENII DIN FAȚĂ*	2438.52	-	-	242.50	-	-	-	2196.02
34	DANEȚI	10317.09	950.60	965.40	965.40	14.80	9366.49	9351.69	9351.69
35	DESA	7631.33	298.86	339.44	505.03	206.17	7332.47	7291.89	7126.30
36	DIOȘTI	6283.19	449.50	449.50	449.50	0.00	5833.69	5833.69	5833.69
37	DOBREȘTI	5630.16	345.93	350.05	350.05	4.12	5284.23	5280.11	5280.11
38	DOBROTEȘTI*	3325.97	-	-	392.30	-	-	-	2933.67
39	DRĂGOTEȘTI	5881.94	394.88	426.32	426.32	31.44	5487.06	5455.62	5455.62
40	DRĂNIC	8053.47	388.36	390.15	390.15	1.79	7665.11	7663.32	7663.32
41	FĂRCAȘ	4756.39	421.50	431.74	305.98	-115.52	4334.89	4324.65	4450.41
42	GALICEA MARE	5885.28	368.35	368.53	497.14	128.79	5516.93	5516.75	5388.14
43	GALICIUICA*	2486.53	-	-	182.50	-	-	-	2304.03
44	GHERCEȘTI	5005.52	393.30	424.79	986.44	593.14	4612.22	4580.73	4019.08
45	GHIDICI*	4519.81	-	-	279.00	-	-	-	4240.81
46	GHINDENI*	3000.98	-	-	296.50	-	-	-	2704.48
47	GIGHERA	13090.84	399.20	407.50	496.90	97.70	12691.64	12683.34	12593.94
48	GIUBEGA	5398.63	501.17	501.19	384.00	-117.17	4897.46	4897.44	5014.63
49	GIURGIȚA	7315.58	371.82	384.00	386.00	14.18	6943.76	6931.58	6929.58
50	GÂNGIOVA	5761.85	280.70	297.29	297.29	16.59	5481.15	5464.56	5464.56
51	GOGOȘU	4310.40	305.07	280.65	280.65	-24.42	4005.33	4029.75	4029.75
52	GOICEA	5869.97	442.50	472.25	327.25	-115.25	5427.47	5397.72	5542.72
53	GOIEȘTI	7843.07	630.98	603.20	741.45	110.47	7212.09	7239.87	7101.62
54	GRECEȘTI	4824.73	370.59	386.80	386.80	16.21	4454.14	4437.93	4437.93
55	IȘALNIȚA	3182.50	207.32	759.25	993.40	786.08	2975.18	2423.25	2189.10
56	IZVOARE	5159.13	263.50	260.00	260.00	-3.50	4895.63	4899.13	4899.13
57	ÎNTORSURA*	3160.52	-	-	209.70	-	-	-	2950.82
58	LEU	11342.38	682.20	708.90	1060.00	377.80	10660.18	10633.48	10282.38
59	LIPOVU	4067.06	241.85	256.05	256.05	14.20	3825.21	3811.01	3811.01
60	MĂCEȘU DE JOS	5784.60	214.85	232.65	261.20	46.35	5569.75	5551.95	5523.40
61	MĂCEȘU DE SUS	3673.63	204.19	196.00	203.13	-1.06	3469.44	3477.63	3470.50
62	MAGLAVIT	9894.30	431.43	435.90	435.90	4.47	9462.87	9458.40	9458.40
63	MALU MARE	3090.50	402.00	561.25	1577.00	1175.00	2688.50	2529.25	1513.50
64	MELINEȘTI	8926.89	745.95	772.21	762.21	16.26	8180.94	8154.68	8164.68
65	MISCHII	5191.61	437.80	459.20	623.65	185.85	4753.81	4732.41	4567.96
66	MÂRȘANI	6619.69	492.16	504.52	504.52	12.36	6127.53	6115.17	6115.17
67	MOȚĂȚEI	12858.08	640.20	673.45	697.10	56.90	12217.88	12184.63	12160.98
68	MURGAȘI	9988.13	568.20	527.73	555.35	-12.85	9419.93	9460.40	9432.78

69	NEGOI	5050.93	493.75	491.71	255.00	-238.75	4557.18	4559.22	4795.93
70	ORODEL	9090.21	510.40	538.30	538.30	27.90	8579.81	8551.91	8551.91
71	OSTROVENI	8207.97	486.00	513.75	664.00	178.00	7721.97	7694.22	7543.97
72	PERIȘOR	6956.05	309.70	345.76	378.02	68.32	6646.35	6610.29	6578.03
73	PIELEȘTI	6568.69	433.55	448.20	1353.84	920.29	6135.14	6120.49	5214.85
74	PISCU VECHI	5757.61	443.82	476.17	296.32	-147.50	5313.79	5281.44	5461.29
75	PLENIȚA	8889.88	461.70	463.45	468.50	6.80	8428.18	8426.43	8421.38
76	PLEȘOI*	4032.26	-	-	255.77	-	-	-	3776.49
77	PODARI	6712.91	465.81	450.67	643.30	177.49	6247.10	6262.24	6069.61
78	POIANA MARE	16435.07	1061.70	1015.91	1297.42	235.72	15373.37	15419.16	15137.65
79	PREDEȘTI	4301.98	490.25	507.25	394.40	-95.85	3811.73	3794.73	3907.58
80	RADOVAN	4914.11	435.00	460.00	284.85	-150.15	4479.11	4454.11	4629.26
81	RAST	8156.87	257.70	315.27	315.27	57.57	7899.17	7841.60	7841.60
82	ROBĂNEȘTI	5958.60	436.15	427.39	955.89	519.74	5522.45	5531.21	5002.71
83	ROJIȘTE*	3303.33	-	-	254.15	-	-	-	3049.18
84	SADOVA	11190.29	557.90	576.17	715.17	157.27	10632.39	10614.12	10475.12
85	SĂLCUȚA	7575.41	347.10	365.00	365.00	17.90	7228.31	7210.41	7210.41
86	SCAEȘTI	3933.94	294.13	298.59	311.97	17.84	3639.81	3635.35	3621.97
87	SEACA DE CÂMP	3643.81	274.10	283.55	283.55	9.45	3369.71	3360.26	3360.26
88	SEACA DE PĂDURE	5744.02	290.15	293.10	308.00	17.85	5453.87	5450.92	5436.02
89	SECU	2917.04	214.42	217.20	217.20	2.78	2702.62	2699.84	2699.84
90	SILIȘTEA CRUCII	3479.09	207.00	201.49	201.49	-5.51	3272.09	3277.60	3277.60
91	ȘIMNICU DE SUS	8115.28	745.60	571.70	1158.30	412.70	7369.68	7543.58	6956.98
92	SOPOT	5538.56	350.35	358.07	358.07	7.72	5188.21	5180.49	5180.49
93	TĂLPAȘ*	3829.93	-	-	197.32	-	-	-	3632.61
94	TEASC	4846.06	350.95	347.30	632.63	281.68	4495.11	4498.76	4213.43
95	TERPEZIȚA	6665.23	300.90	342.30	342.30	41.40	6364.33	6322.93	6322.93
96	TESLUI	7427.23	437.19	447.97	481.21	44.02	6990.04	6979.26	6946.02
97	ȚUGLUI	3822.96	202.90	210.90	284.20	81.30	3620.06	3612.06	3538.76
98	UNIREA	4780.18	348.00	373.00	373.00	25.00	4432.18	4407.18	4407.18
99	URZICUȚA	6093.53	418.80	484.10	560.25	141.45	5674.73	5609.43	5533.28
100	VALEA STANCIULUI	11072.75	651.70	637.50	637.50	-14.20	10421.05	10435.25	10435.25
101	VELA	8252.12	320.30	354.35	354.35	34.05	7931.82	7897.77	7897.77
102	VERBIȚA	4510.98	162.55	161.70	161.70	-0.85	4348.43	4349.28	4349.28
103	VÂRTOP	3284.23	207.00	218.25	218.25	11.25	3077.23	3065.98	3065.98
104	VÂRVORU DE JOS	10800.64	494.00	511.34	511.34	17.34	10306.64	10289.30	10289.30
	TOTAL	742175.88	49562.56	52890.40	63145.92	**8966.08**	646177.07	642849.23	679029.96

*** U.A.T. founded in the year 2004**

B. THE FLOOD RISK



According to the County Plan of Analysis Risk Management, as well as to the maps of floodable areas, especially in the Danube Meadow, in the neighbourhood of Jiu river and of the Desnăţui, Raznic and Teslui rivers, the most exposed communes in the county are: Dăbuleni, Călărași, Bechet, Ostroveni, Gighera, Măcești de Jos, Cârna, Bistreț, Catane, Negoi, Cetate, Maglavit, Calafat, Ciupercenii Noi, Desa, Piscu Vechi,Ghidici, Rast, Sadova, Dobrești, Gângiova, Valea Stanciului, Bratovoești,Țuglui, Malu Mare, Teasc, Drănic, Rojiște, Grecești, Cernătești, Predești,Breasta, Goicea, Bârca, Giurgița, Cerăt, Lipovu, Radovan, Filiași, Brădești,Coțofenii din Față, Șalnița, Coțofenii din Dos, Scăești, Braloștița, Bucovăț,Podari, Craiova, Ghercești, Pielești și Robănești.

CONCLUSION

As a consequence, the study will serve to the strategic planning at county level by the accomplishment of a radiography of the rural area, by the analysis of certain aspects such as the territory, the fragmentation of the agricultural exploitation lands (the arable patrimony), the quality of the agricultural activities (the economy of the arable land) between the administrative boundaries of Dolj county.

A conclusion would be that the functionality of this study addresses different public stakeholders, policy makers - with respect to the organisation of the rural areas and the local and regional development policies, thus contributing to the achievement of the complete perspective of the development of the rural space between the boundaries of the Dolj county.

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