

SCERIN-2 MEETING
Jagiellonian University in Krakow, Poland,
Institute of Geography and Spatial Management
9-10 June 2014



**Land use and land cover changes
in the Republic of Moldova**

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1. Geomorphology and Ecopedology
2. Climatology and environmental risks
3. Geography Landscape
4. Natural and anthropogenic ecosystems
5. Laboratory of Ecourbanism
6. Environmental impact and environmental regulations



Work in Institute...and outside!

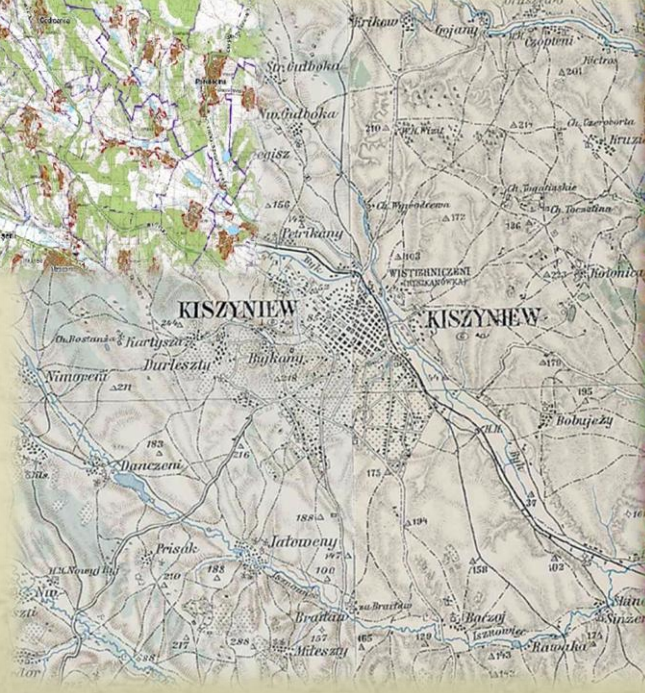
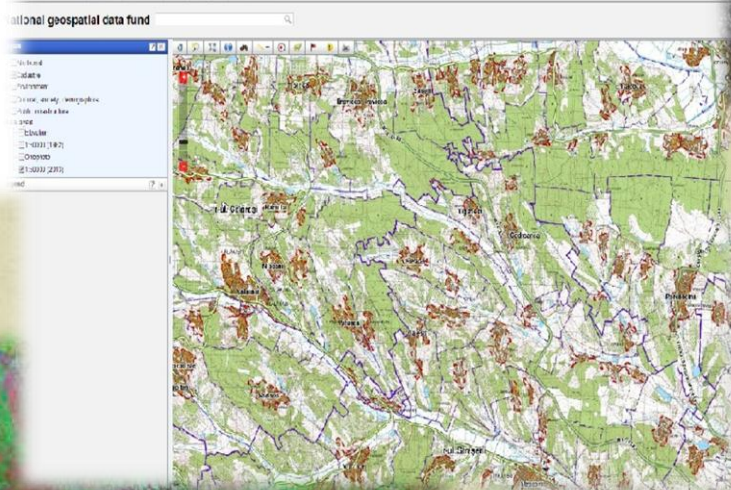
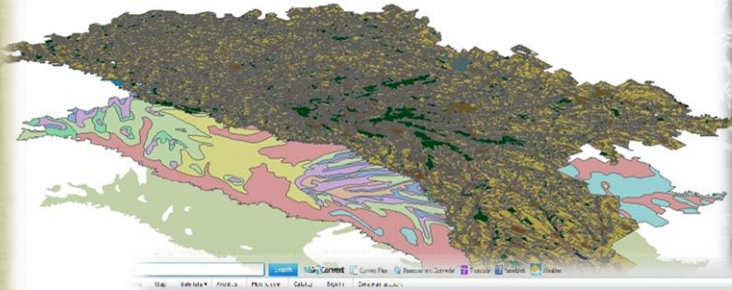


Database...

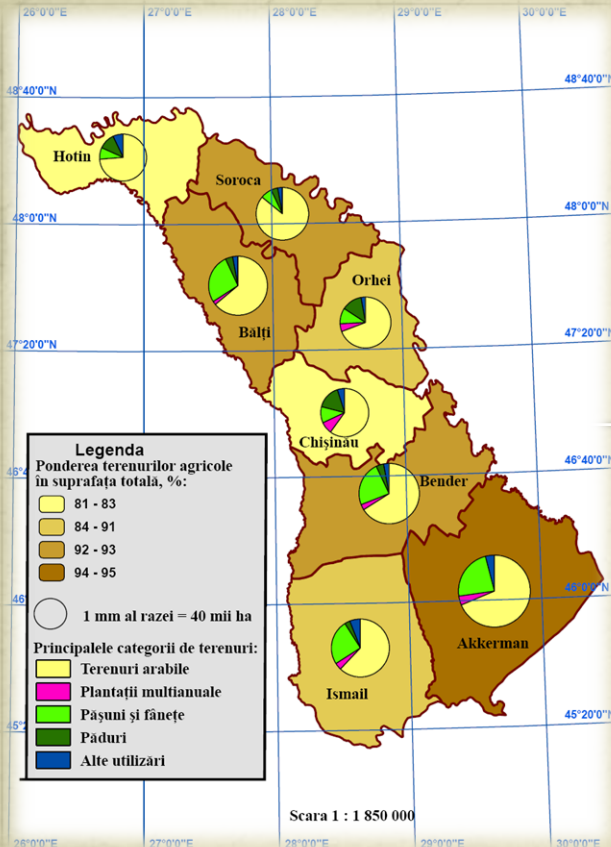


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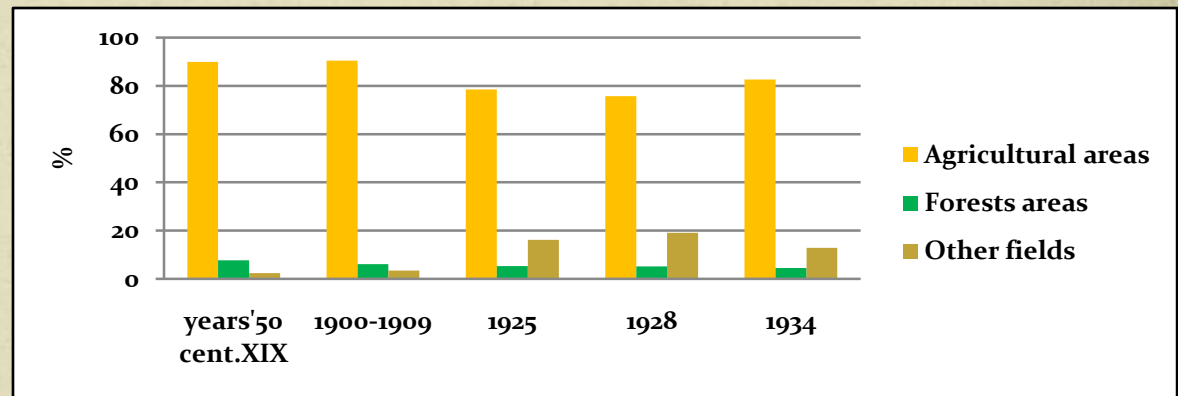
Cadastre land - 1850 - 2012



Land use changes in 1850 - 1950

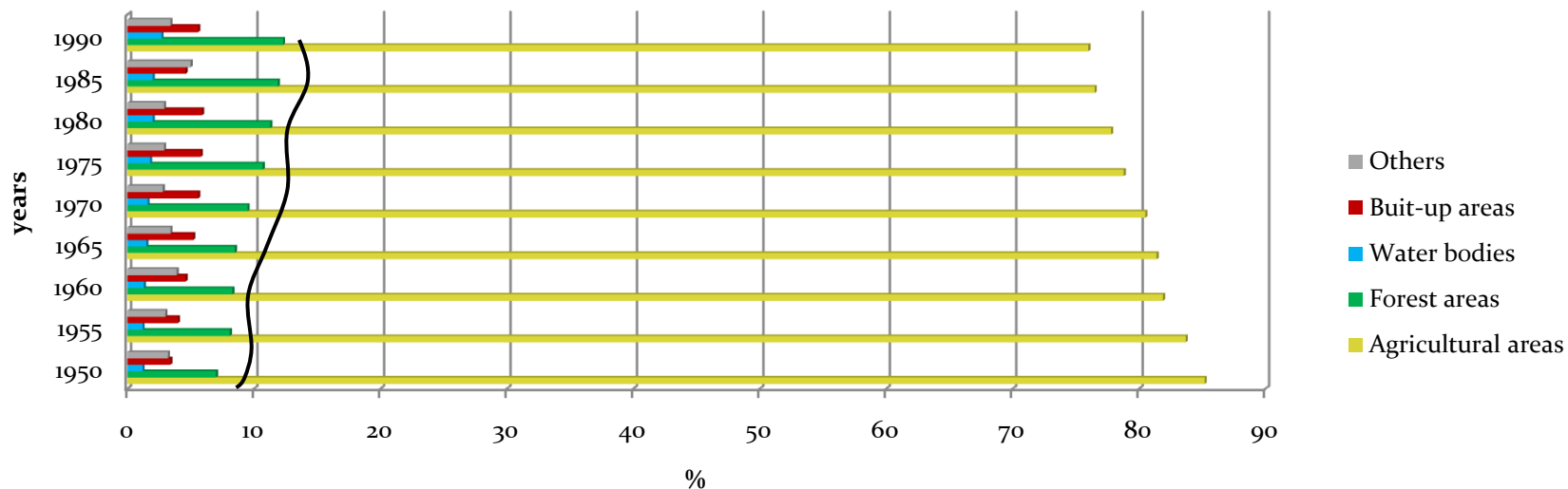


Category of land	years'50 cent. XIX		1900-1909		1925		1928		1934	
	ths. ha	%	ths. ha	%	ths. ha	%	ths. ha	%	ths. ha	%
Total	3599,6	100,0	3449,0	100,0	4442,2	100,0	4442,2	100,0	4442,2	100,0
Agricultural areas	3234,4	89,9	3117,9	90,4	3488,8	78,5	3364,9	75,7	3671,6	82,6
Forest areas	276,1	7,7	210,6	6,1	234,2	5,3	232,6	5,2	199,5	4,5
Other fields	89,1	2,4	120,5	3,5	719,2	16,2	844,6	19,1	571,1	12,9



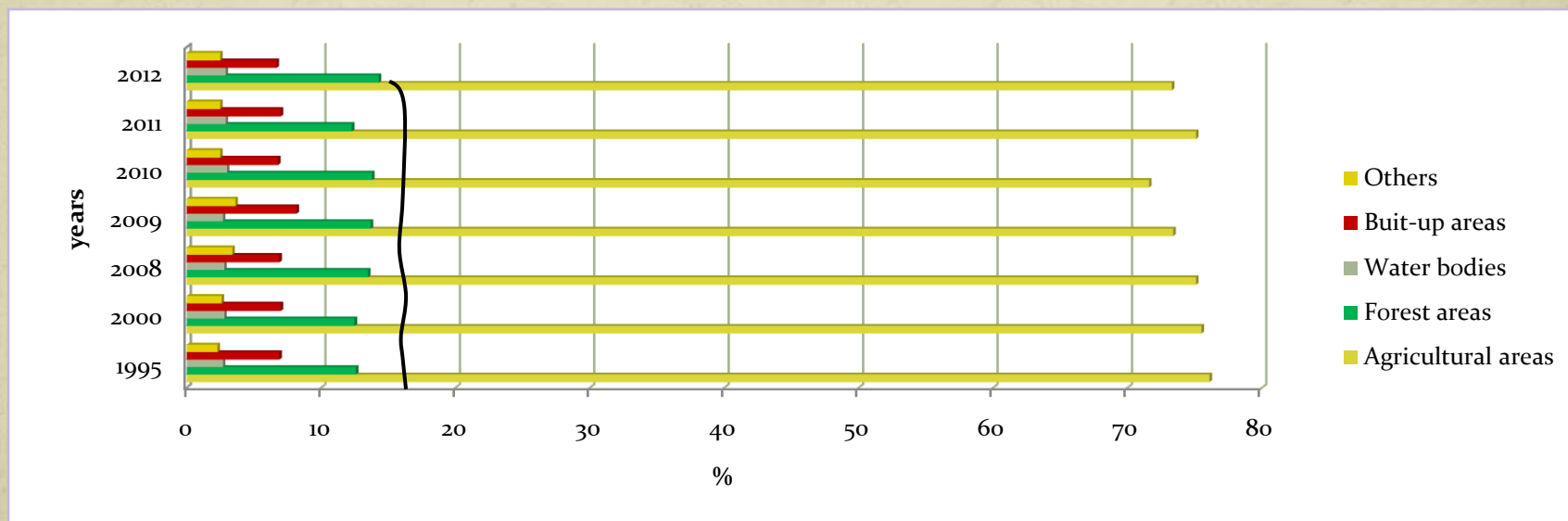
Land use changes in 1950 - 1990

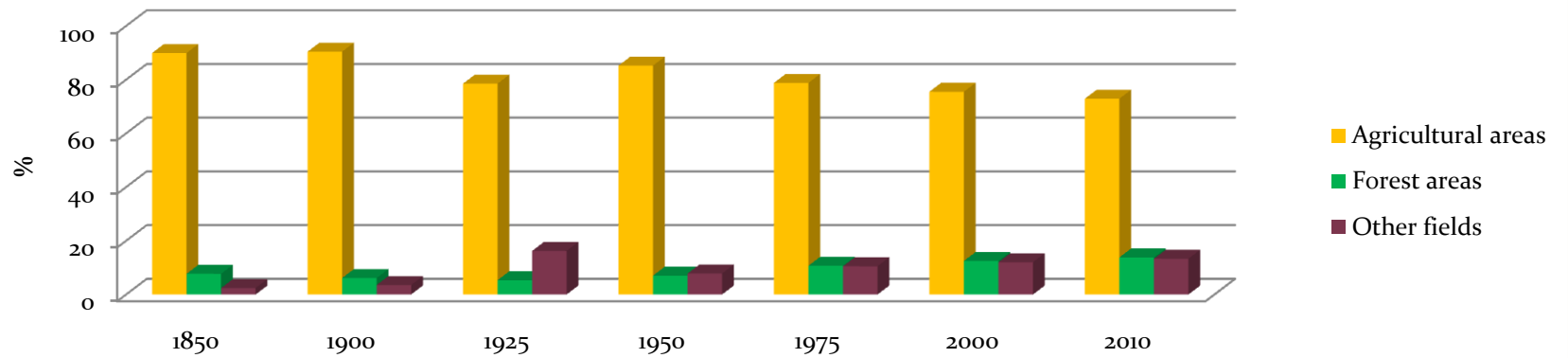
Years	Total		Agricultural fields		Forest areas		Water bodies		Built-up areas		Other areas	
	ths. ha	%	ths. ha	%	ths. ha	%	ths. ha	%	ths. ha	%	ths. ha	%
1950	3296,7	100	2808,2	85,2	231,4	7,0	38,2	1,2	114,1	3,4	104,8	3,2
1955	3374,0	100	2820,4	83,7	271,8	8,1	40,1	1,2	135,7	4,0	103,4	3,0
1960	3376,1	100	2763,5	81,9	278,9	8,3	44,4	1,3	157,7	4,6	131,6	3,9
1965	3376,0	100	2746,6	81,4	287,6	8,5	51,4	1,5	176,6	5,2	113,8	3,4
1970	3376,0	100	2717,5	80,5	320,2	9,5	54,8	1,6	187,7	5,6	95,7	2,8
1975	3376,0	100	2661,1	78,8	360,2	10,7	60,5	1,8	194,6	5,8	97,8	2,9
1980	3376,0	100	2626,0	77,8	381,7	11,3	65,9	2,0	202,3	5,9	97,4	2,9
1985	3376,0	100	2581,0	76,5	403	11,9	69	2,0	156	4,6	167	5,0
1990	3376,0	100	2566,0	76,0	416	12,3	90	2,7	188	5,6	116	3,4



Land use changes in 1990 - 2012

Years	Total		Agricultural areas		Forest areas		Water bodies		Built-up areas		Other areas	
	ths. ha	%	Mii ha	%	Mii ha	%	Mii ha	%	Mii ha	%	Mii ha	%
1995	3384,6	100	2581	76.1	425	12,6	92	2,7	235	6,9	76,6	2,3
2000	3384,6	100	2556	75,5	423	12,5	96	2,8	236	7,0	86,6	2,6
2008	3384,6	100	2543	75,1	453	13,5	96	2,8	234	6,9	116,6	3,4
2009	3126.6	100	2485	73,4	431	13,7	87	2,7	256	8.18	113,6	3.63
2010	3025,7	100	2231	71.6	419	13.8	91	3.0	206	6.8	78	2.5
2011	3326.1	100	2498	75.1	411	12.3	99	2.9	233	7.0	85	2.5
2012	3034.2	100	2227	73.3	434	14.3	90	2.9	206	6.7	77	2.5





Training - 2004

Agency for Land Relations
and Cadastre

12 researchers from
different institution/organization

UN/FAO Training in RS
Land Cover/Land Use “Building
Capacity in Inventory of Land
Cover/Land Use by Remote
Sensing
”, Chisinau, Rep.Moldova, 2004-
2005

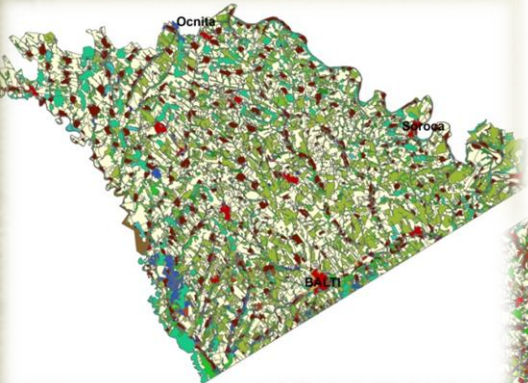


www.geoportal.md

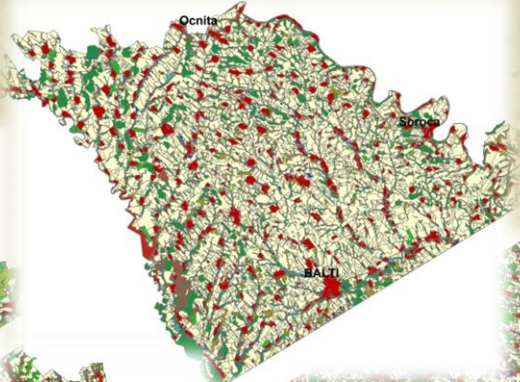


CLASSIFICATION

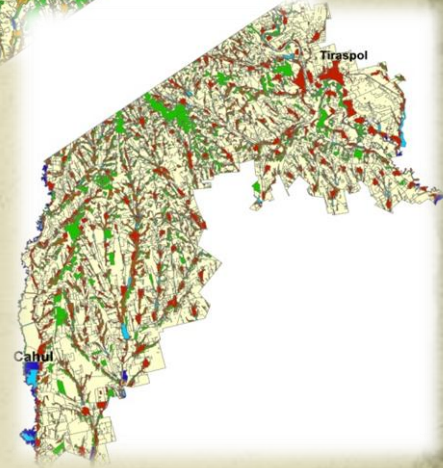
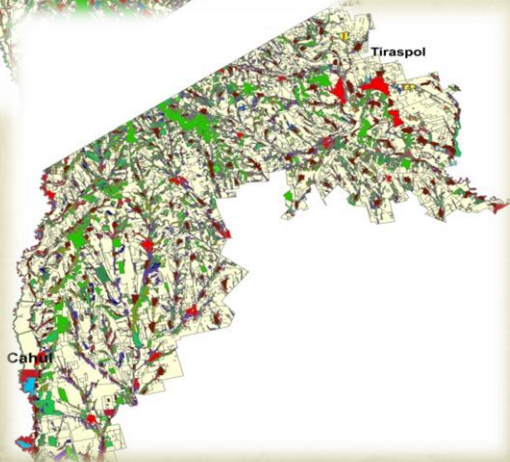
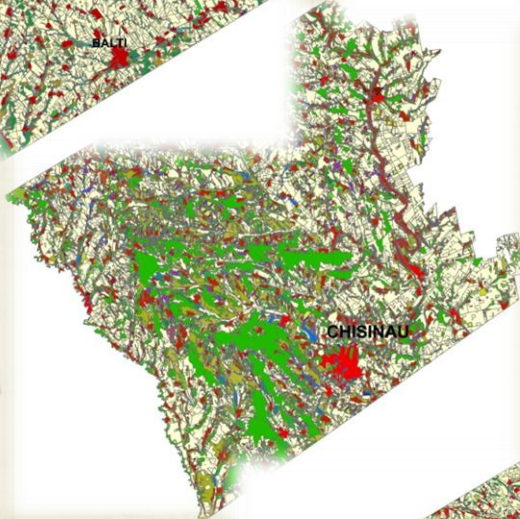
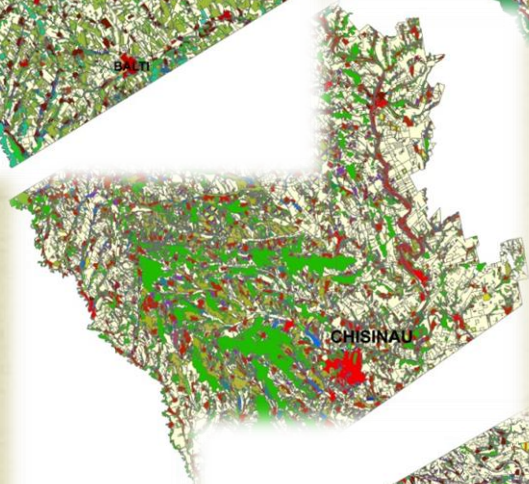
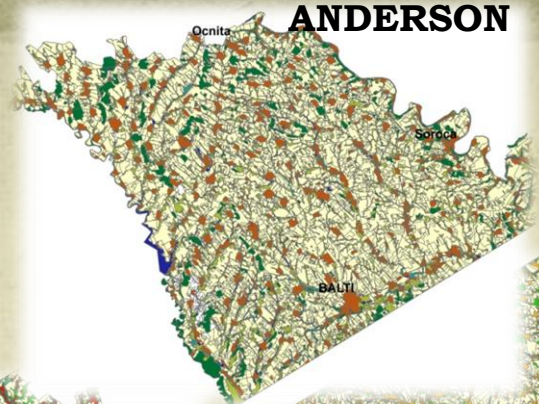
FAO MD1



FAO MD2



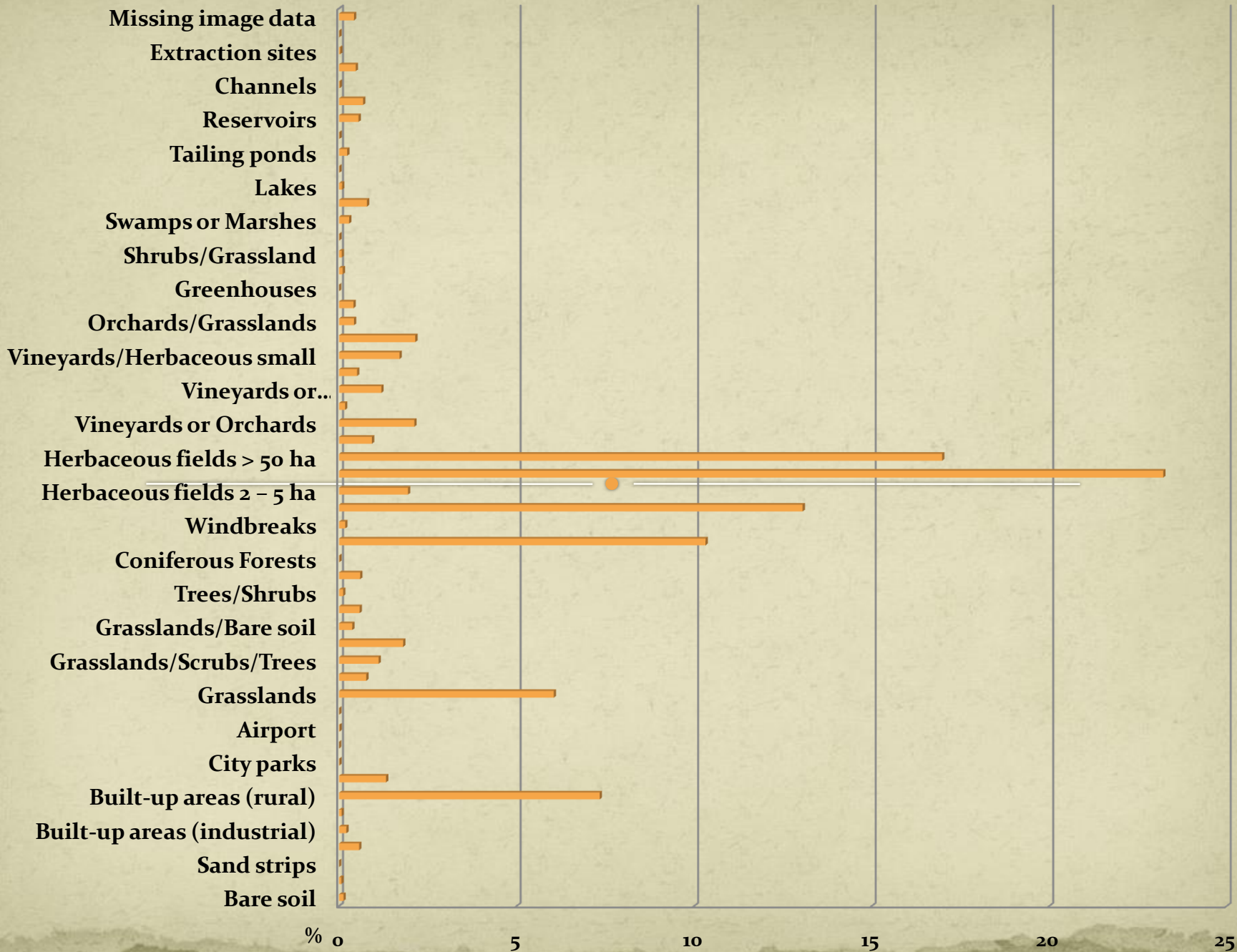
ANDERSON



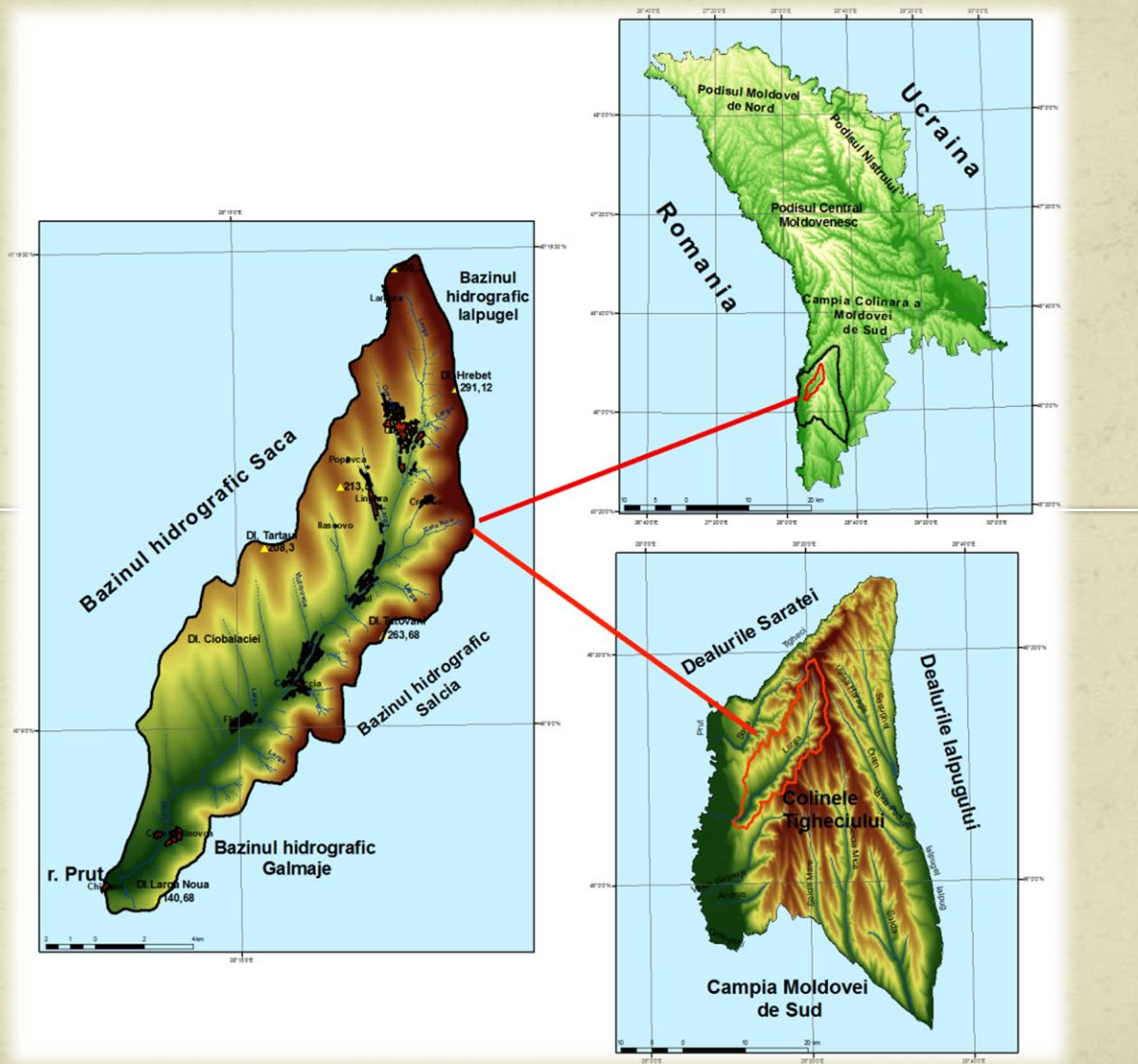
No.	FAO MD1	FAO MD2	ANDERSON	SURFACE (km2)	Total of Moldova surface
1	Bare soil	Bare Areas	Barren Land	43.21	0.12
2	Bare soil/Grasslands	Mixed Units	Barren Land	22.15	0.06
3	Sand strips	Bare Areas	Barren Land	0.48	0.001
4	Built-up areas (agricultural)	Urban and Artificial Surfaces	Urban or Built-up Land	191.45	0.56
5	Built-up areas (industrial)	Urban and Artificial Surfaces	Urban or Built-up Land	69.92	0.20
6	Built-up areas (other)	Urban and Artificial Surfaces	Urban or Built-up Land	24.62	0.07
7	Built-up areas (rural)	Urban and Artificial Surfaces	Urban or Built-up Land	2484.06	7.34
8	Built-up areas (urban-main cities)	Urban and Artificial Surfaces	Urban or Built-up Land	448.17	1.32
9	City parks	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	3.55	0.01
10	Cultural areas (entertainment and recreation)	Urban and Artificial Surfaces	Urban or Built-up Land	0.16	0.0004
11	Airport	Urban and Artificial Surfaces	Urban or Built-up Land	4.91	0.01
12	Cemeteries	Urban and Artificial Surfaces	Urban or Built-up Land	1.84	0.005
13	Grasslands	Natural and Semi-natural Terrestrial Vegetation	Rangeland	2046.48	6.04
14	Grasslands/Trees	Mixed Units	Rangeland	259.57	0.76
15	Grasslands/Scrubs/Trees	Mixed Units	Rangeland	376.78	1.11
16	Grasslands/Scrubs	Mixed Units	Rangeland	610.78	1.8
17	Grasslands/Bare soil	Mixed Units	Rangeland	125.79	0.37
18	Trees/Grasslands	Mixed Units	Forest Land	196.25	0.57

19	Trees/Shrubs	Mixed Units	Forest Land	39.88	0.11
20	Trees/Shrubs/Grasslands	Mixed Units	Forest Land	201.18	0.59
21	Coniferous Forests	Natural and Semi-natural Terrestrial Vegetation	Forest Land	3.28	0.009
22	Deciduous forests	Natural and Semi-natural Terrestrial Vegetation	Forest Land	3492.72	10.32
23	Windbreaks	Cultivated and Managed Terrestrial Vegetation	Forest Land	59.47	0.17
24	Herbaceous fields < 2 ha	Cultivated and Managed Terrestrial 1.94Vegetation	Agricultural Land	4418.20	13.05
25	Herbaceous fields 2 – 5 ha	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	657.41	1.94
26	Herbaceous fields 5 – 50 ha	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	7855.25	23.21
27	Herbaceous fields > 50 ha	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	5747.48	16.98
28	Vineyards	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	313.73	0.92
29	Vineyards or Orchards	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	717.67	2.12
30	Vineyards or Orchards/Grasslands	Mixed Terrestrial Vegetation	Agricultural Land	54.40	0.16
31	Vineyards or Orchards/Herbaceous small	Mixed Cultivated and Managed Terrestrial Vegetation	Agricultural Land	403.11	1.19
32	Vineyards/Grasslands	Mixed Terrestrial Vegetation	Agricultural Land	172.31	0.50
33	Vineyards/Herbaceous small	Mixed Cultivated and Managed Terrestrial Vegetation	Agricultural Land	577.30	1.70

34	Orchards	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	726.81	2.14
35	Orchards/Grasslands	Mixed Terrestrial Vegetation	Agricultural Land	142.89	0.42
36	Orchards/Herbaceous small	Mixed Cultivated and Managed Terrestrial Vegetation	Agricultural Land	137.44	0.40
37	Greenhouses	Cultivated and Managed Terrestrial Vegetation	Agricultural Land	0.08	0.0002
38	Riverine vegetation	Natural and Semi-natural Terrestrial Vegetation	Rangeland	35.40	0.10
39	Shrubs/Grassland	Mixed Units	Rangeland	26.21	0.07
40	Shrubs/Trees	Mixed Units	Rangeland	3.61	0.010
41	Swamps or Marshes	Aquatic Vegetation	Wetland	96.22	0.28
42	Wetlands	Aquatic Vegetation	Wetland	266.06	0.78
43	Lakes	Natural Water Bodies	Water	29.00	0.08
44	Fishponds	Artificial Water Bodies	Water	3.29	0.009
45	Tailing ponds	Artificial Water Bodies	Water	77.77	0.22
46	Oxbows	Natural Water Bodies	Water	4.25	0.01
47	Reservoirs	Artificial Water Bodies	Water	185.79	0.54
48	River	Natural Water Bodies	Water	229.24	0.67
49	Channels	Artificial Water Bodies	Water	6.75	0.01
50	Impoundments	Artificial Water Bodies	Water	158.85	0.46
51	Extraction sites	Urban and Artificial Surfaces	Urban or Built-up Land	11.09	0.03
52	Dump sites	Urban and Artificial Surfaces	Urban or Built-up Land	2.47	0.007
53	Missing image data	Other	No data	142.26	0.42
	Total			33839.28	100%



Case study: The Larga Catchment



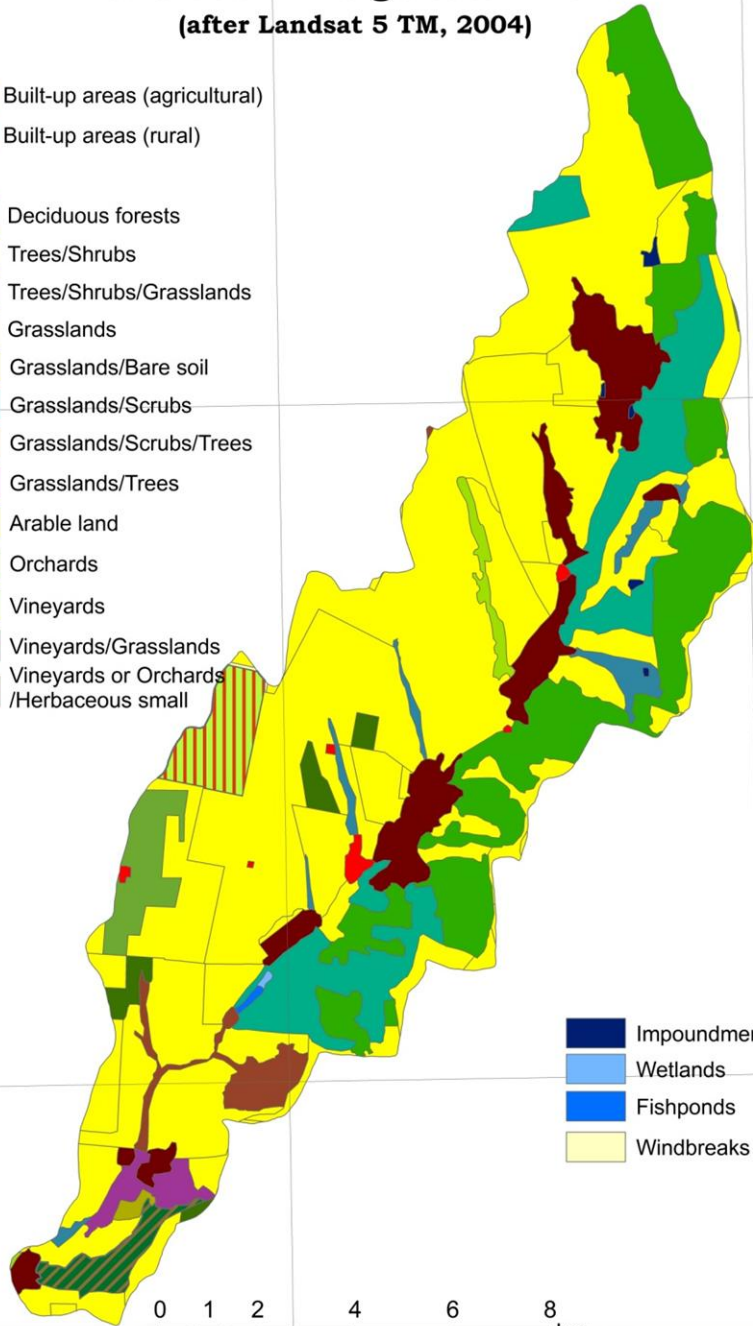
Land Use in Larga catchment

(after Landsat 5 TM, 2004)

- Built-up areas (agricultural)
- Built-up areas (rural)

- Deciduous forests
- Trees/Shrubs
- Trees/Shrubs/Grasslands
- Grasslands
- Grasslands/Bare soil
- Grasslands/Scrubs
- Grasslands/Scrubs/Trees
- Grasslands/Trees
- Arable land
- Orchards
- Vineyards
- Vineyards/Grasslands
- Vineyards or Orchards /Herbaceous small

- Impoundments
- Wetlands
- Fishponds
- Windbreaks



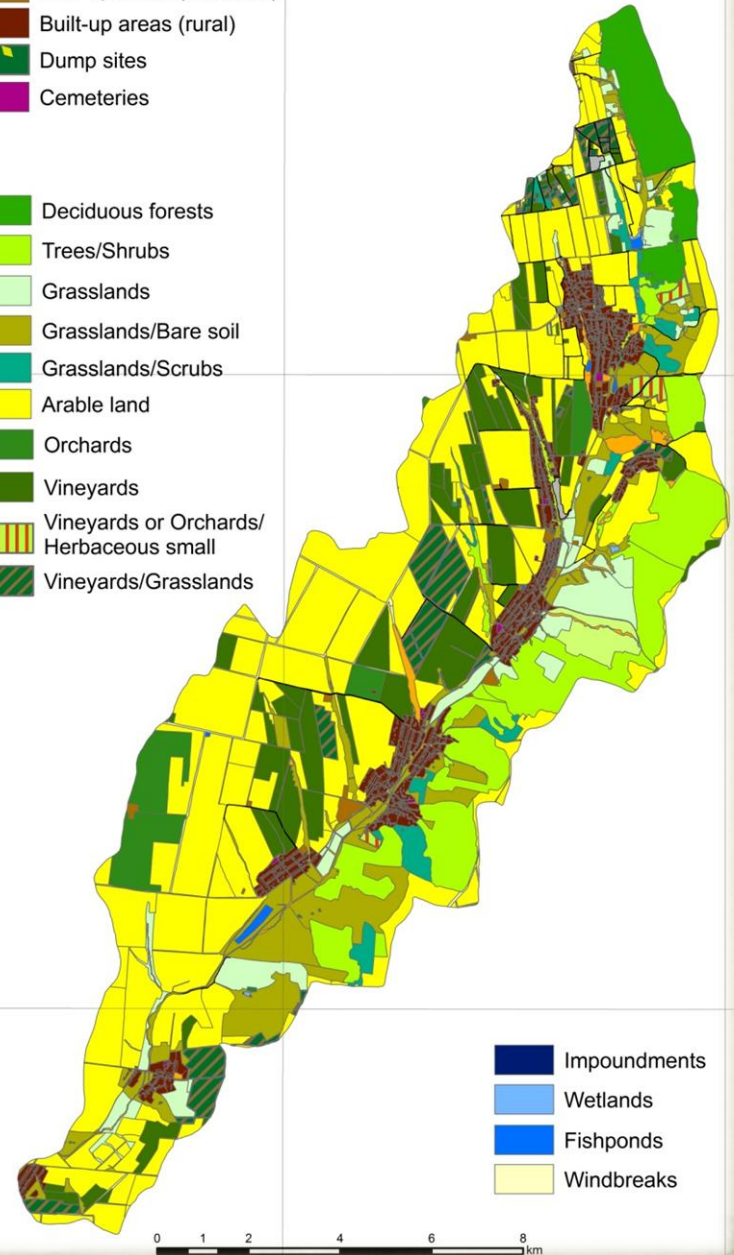
Land Use in Larga catchment

(after orthophotos 2008)

- Bare soil
- Built-up areas (industrial)
- Built-up areas (rural)
- Dump sites
- Cemeteries

- Deciduous forests
- Trees/Shrubs
- Grasslands
- Grasslands/Bare soil
- Grasslands/Scrubs
- Arable land
- Orchards
- Vineyards
- Vineyards or Orchards/Herbaceous small
- Vineyards/Grasslands

- Impoundments
- Wetlands
- Fishponds
- Windbreaks

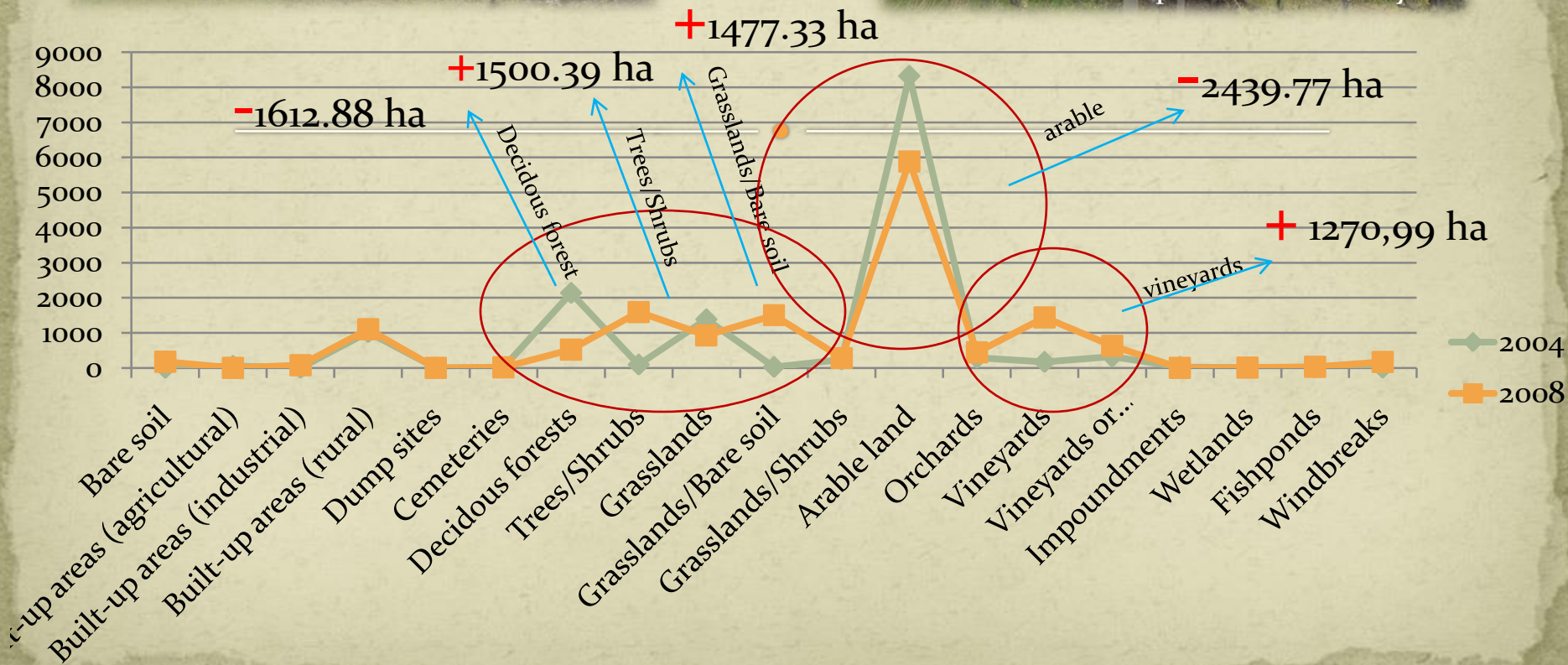




Vineyards degraded/grasslands



New plantation of vineyards



Thanks for
your attention!!!

