



**8<sup>th</sup> Bilateral Geodetic Meeting Poland-Italy**

Wrocław (Poland), 22-24 June 2006

# **CARTOGRAPHY IN THE FACE OF CONTEMPORARY SOCIAL PROBLEMS**

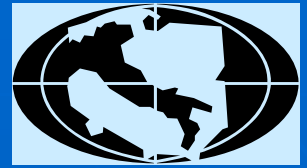
**Ewa Krzywicka-Blum  
Agricultural University of Wrocław**



Since the end of eighteenth century the science has to be branched because of differences between methods and language of description. Each of several particular disciplines has to define its basic notions, features, characteristics as well as specific rules and kinds of methodology suitable to the main subject of interest.

Cartography answered to such a situation introducing to the traditional means of coding of real objects' arrangement also designations representing different abstract characteristics.

New methods allowed to present spatial distribution of different kinds of real and abstract features as the synthetic pictorial model which make possible holistic observation of spatial relations between components of various studied wholes.



After the Second World-War uncontrollable growth of population living in technologically backward countries and, as a consequence, scale of differences between level of human life in different parts of the globe turns attention of international organizations towards social problems.

New discipline: socio-demography as the main subject of interests indicates relation between groups of people and studies over particular groups. Unfortunately it can be observed that up to now in cartography many important socio-demographical features are not represented. Lack of standardized, spatially and temporally representative data should not justify this state. As in case of many disciplines *in status nascendi* the language of description of socio-demographic phenomena is not sufficiently formalized to be directly transformed into visual form. Cartographers have to propose modelling of suitably transformed data, introducing new, defined indexes and adding textual commentary.

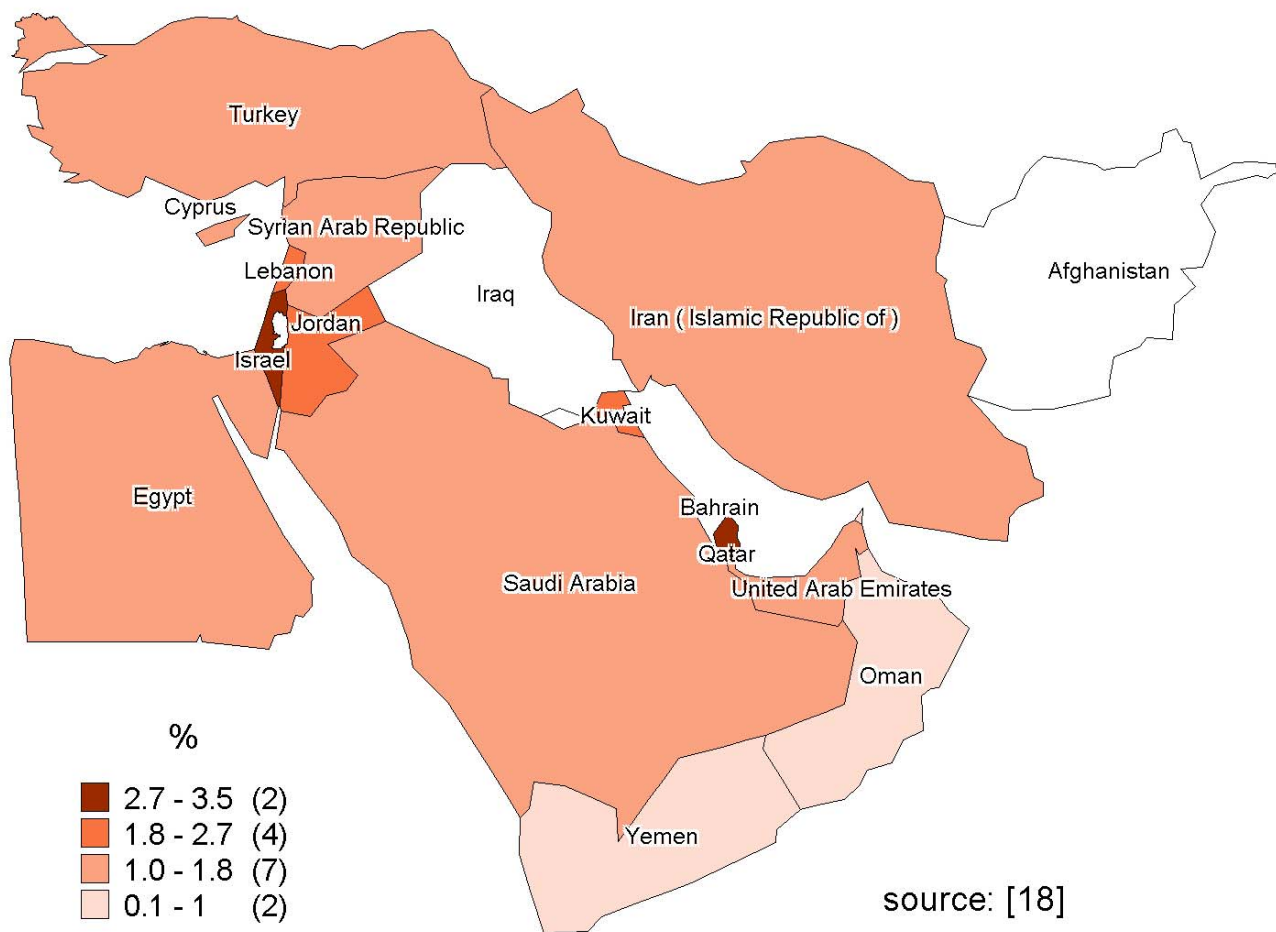


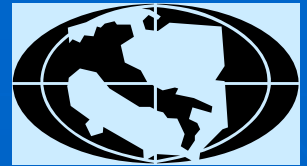
Several examples prepared in the Agricultural University of Wrocław shows possible solutions.

The first example presents gender conditions in the Middle East within the population of higher education, the second one the structural types of subpopulation aged 65 and over in Europe, the third – the dynamic differentiation of globally treated illiterateness reducing.

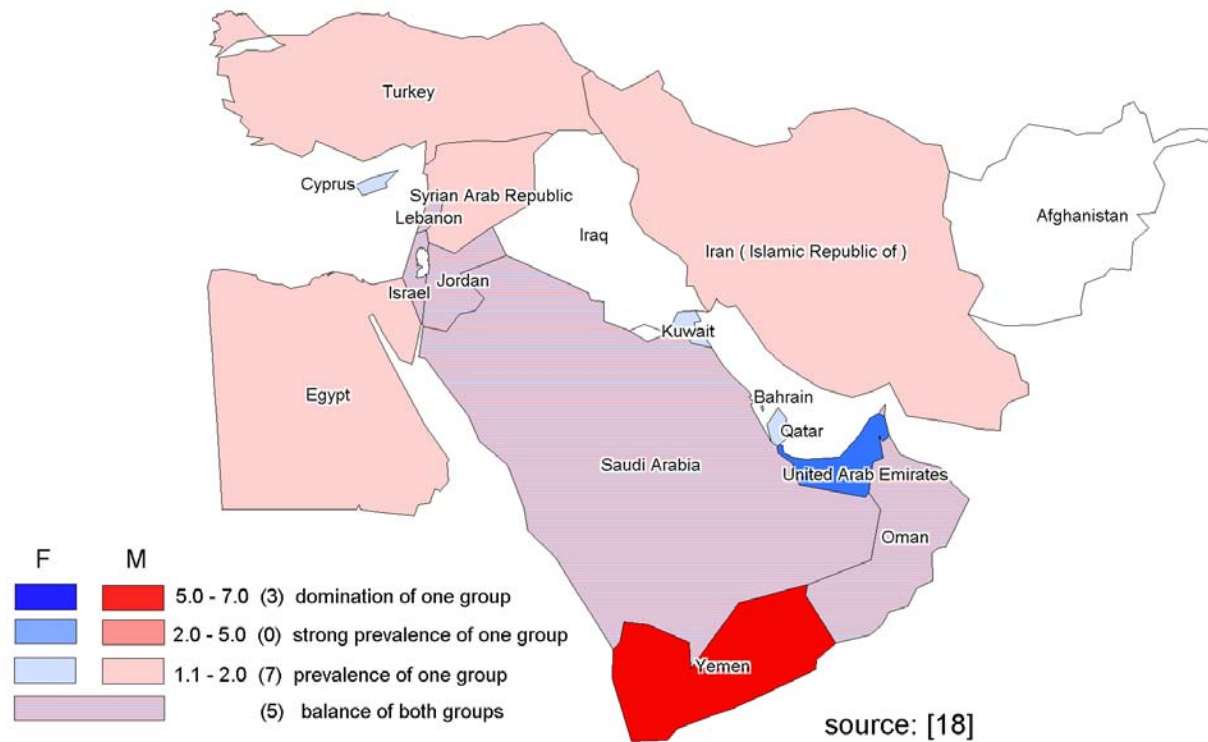


### 3. 5. A. MIDDLE EAST: SHARE OF WOMEN IN THE POPULATION OF HIGHER EDUCATION (YEAR 2004)



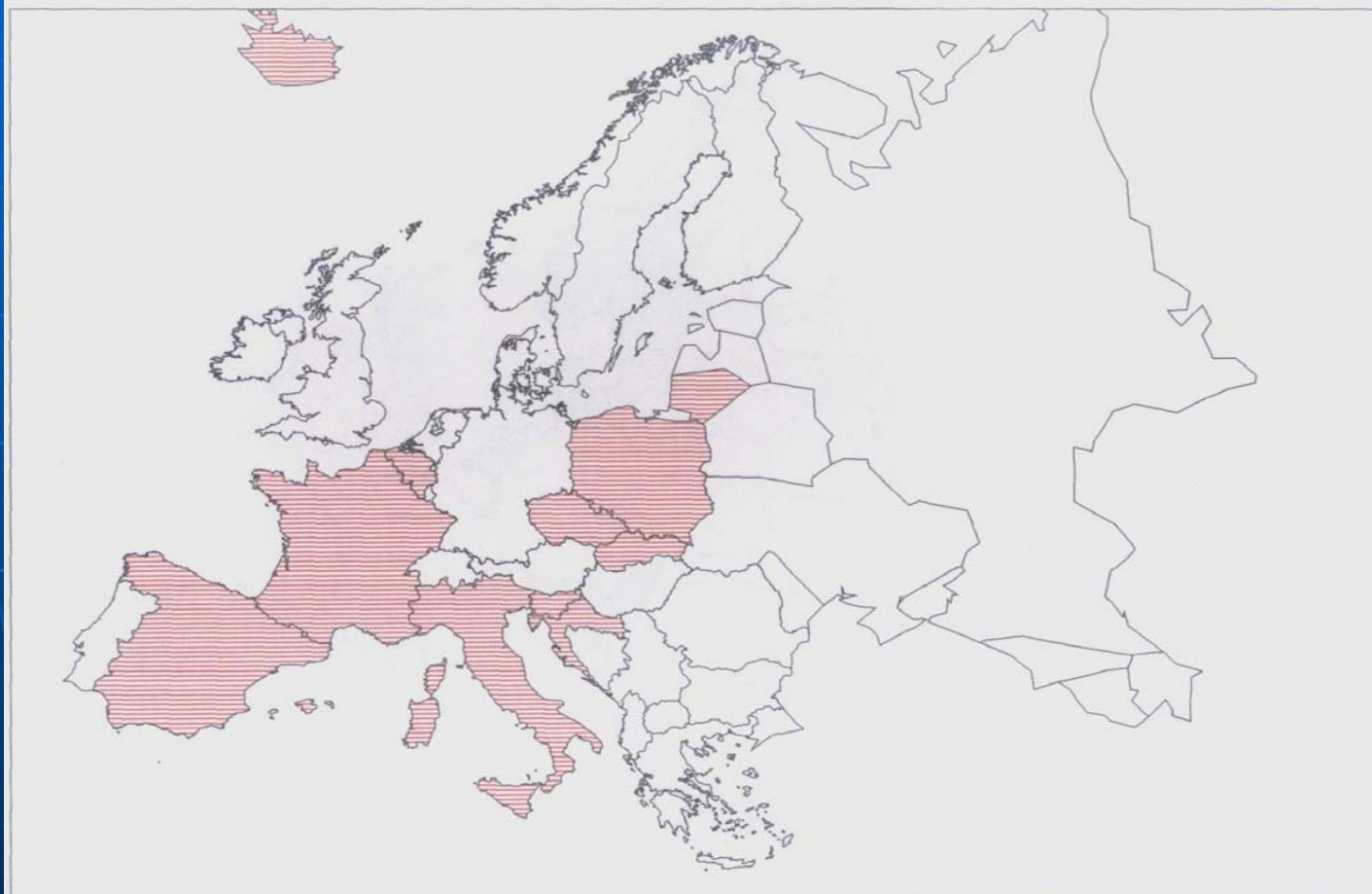


### 3. 5. B. MIDDLE EAST: THE STRUCTURE OF THE GROUP OF PEOPLE OF HIGHER EDUCATION IN 2004 ACCORDING TO GENDER - INDEX $g_{i, F, M}$





Dominujące typy zmian struktury rodzajowej. Typ A  
Skala 1 : 35 000 000



Legenda:

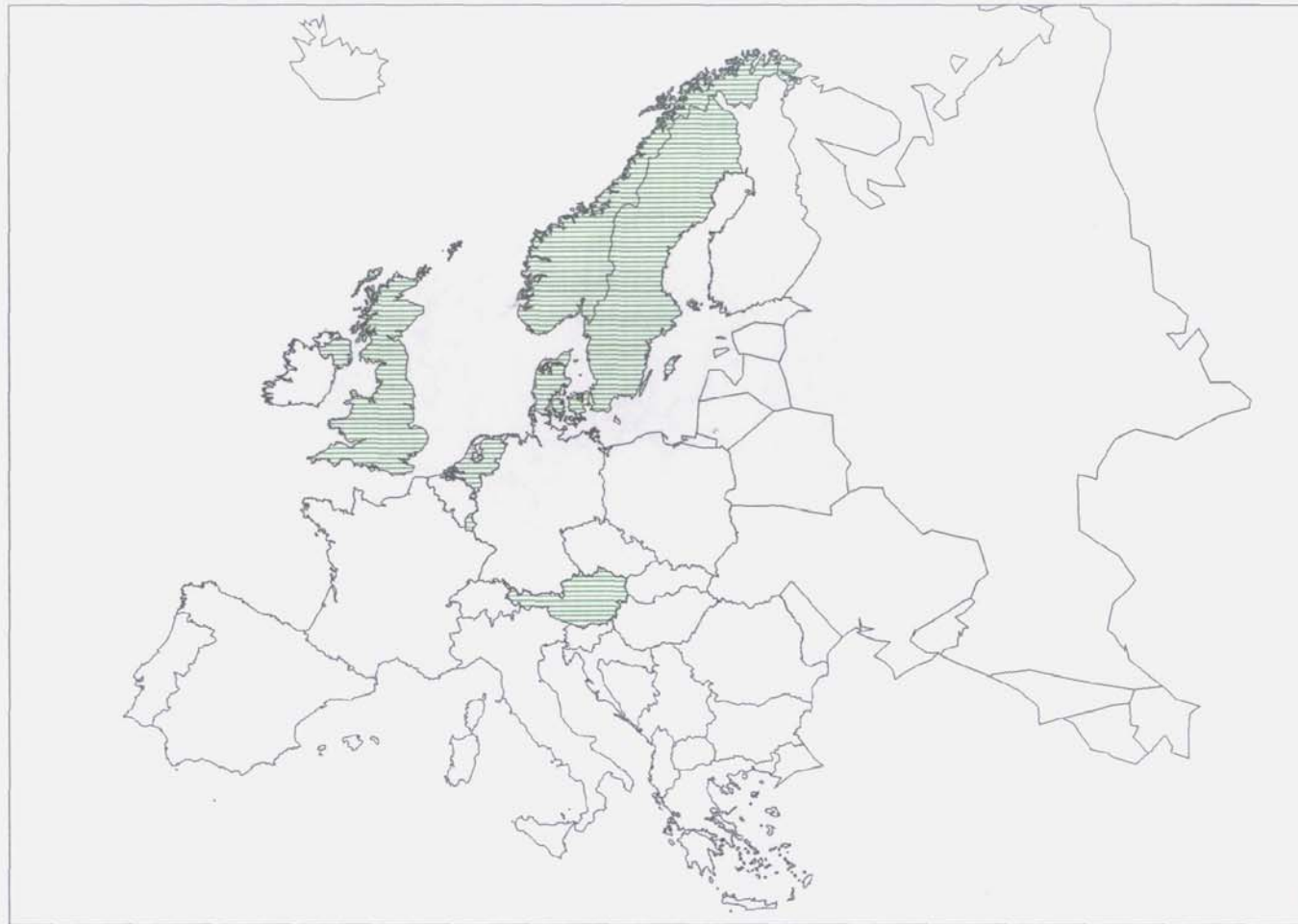
 Typ A







**Dominujące typy zmian struktury rodzajowej. Typ B**  
**Skala 1 : 35 000 000**



**Legenda:**

 Typ B

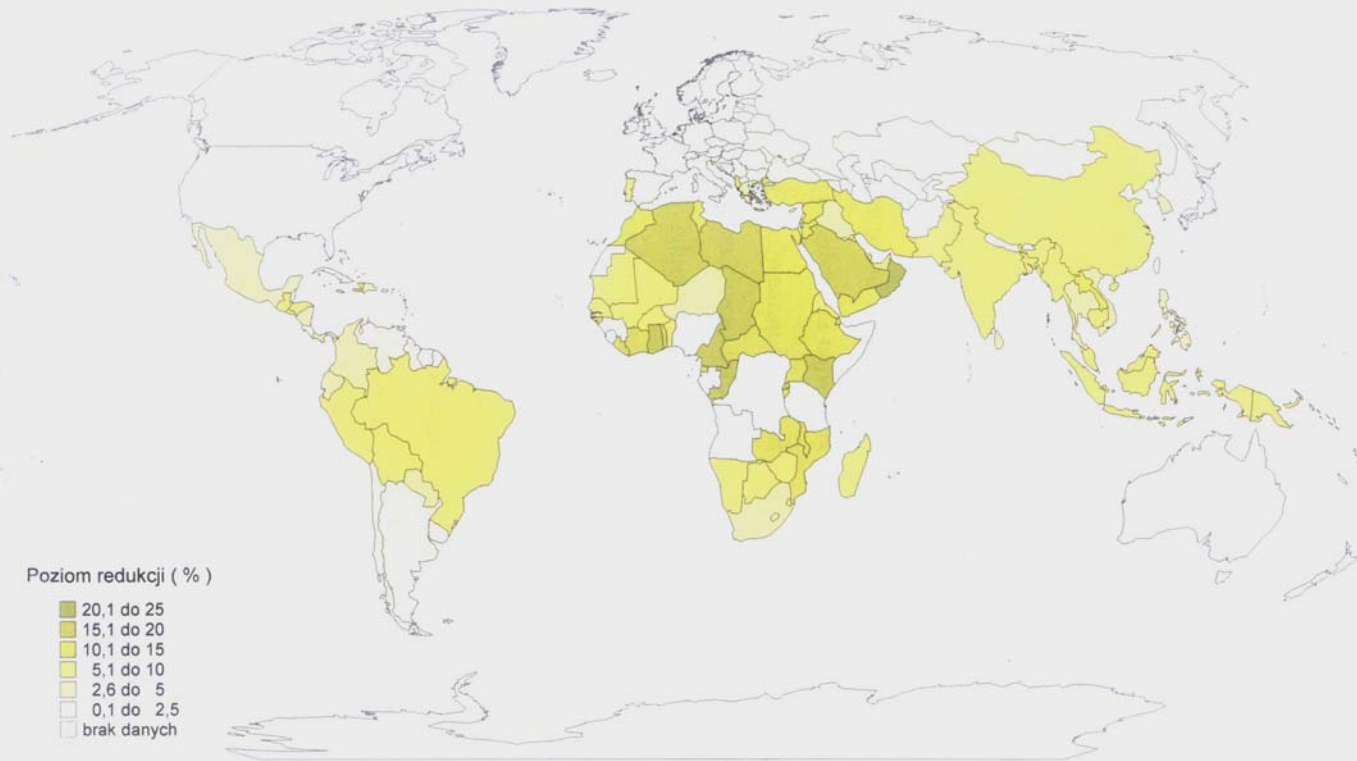
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Mapa 3

Redukcja analfabetyzmu w grupie kobiet w okresie 1990 - 2000



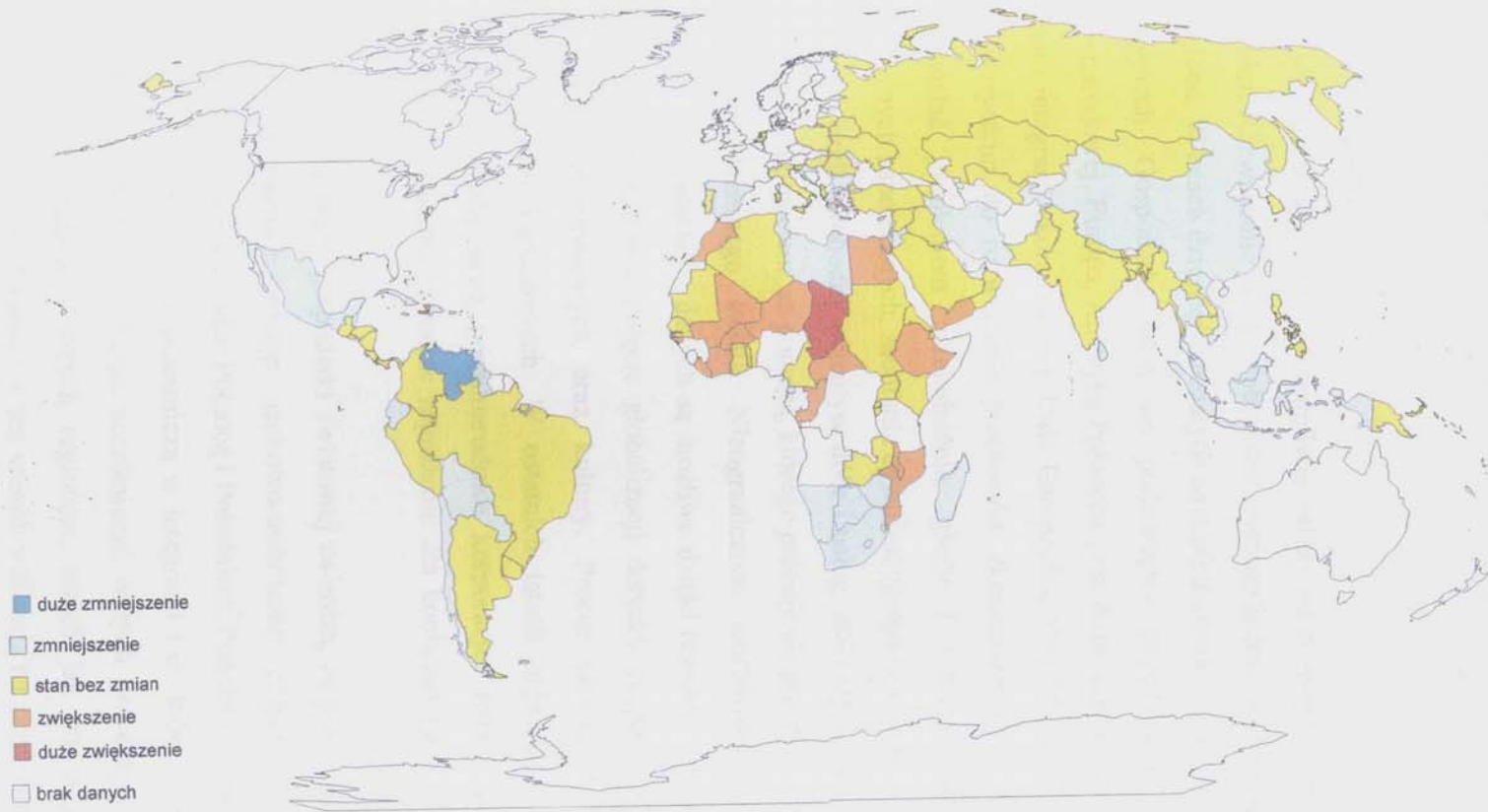
SKALA

1 : 150 000 000



Mapa 5

Tempo procesu zmniejszania analfabetyzmu w grupie kobiet w okresie 1980 - 2000



SKALA

1 : 150 000 000

## 'Preservation of human rights' as a map contents



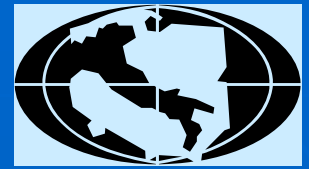
As in each case of projecting a map which have to reveal significant spatial properties of very complex feature it is necessary to dispose the knowledge related to hierarchy between important components of main element of given map' contents.

In the frame of ICA's commission of Gender and Cartography the list of features (attributes dividing society into several groups) has been chosen and evaluated accordingly to the force of supporting or blocking influence on preservation of human rights in nine distinguished spheres.

The groups of conditions of human rights protection are related to:

- 1. EXISTENTIAL CONDITIONS** (1. Access to the medical help, 2. Birthright, 3. Ensuring the family existential needs),
- 2. LABOUR CONDITIONS** (1. Access to work, 2. Condition of promotion and senior position, 3. Earning),
- 3. EDUCATIONAL AND SOCIO-CULTURAL NEEDS** (1. Access to education, 2. Social and political needs, 3. Cultural needs).

## The listed features are:



1. **GENDER** (women, men),
2. **AGE** (non working age, working age),
3. **MARITAL STATUS** (single, married),
4. **CITIZENSHIP** (of given country, other),
5. **SOURCE OF INCOME**  
(work, rent, pension; on the maintenance),
6. **HEALTH STATUS** (non disabled, disabled),
7. **LITERACY** (literate, illiterate),
8. **EDUCATION** (primary, secondary and higher),
9. **PROFESSION** (with profession, without profession),
10. **COUNTRY OF BIRTH** (of census, other),
11. **PLACE OF RESIDENCE ONE YEAR BEFORE CENSUS**  
(of census, other),
12. **PLACE OF RESIDENCE** (in the same country, abroad),
13. **NATIONALITY/RACE** (of the majority, other),
14. **USED LANGUAGE** (of the majority, other),
15. **WORSHIP** (without restrictions, with restrictions).

For general analysis, proposed in this paper, the internal division of features has been aggregated to binary form, the nine sphere of human rights have been considered into three comparable sections, and the weights have been normalized.



Table 1

Differences between the weights of **supporting** force within two subpopulations according to distinguished features (attributes) determining the division of society

S   E C T I O N S											
Existential				Labour			Educational socio-cultural				
No	1	2	3	1	2	3	1	2	3	dw	No
1.	0.667	1.000	0.000	0.667	0.667	0.667	0.500	0.500	0.166	0.54	1
2.	0.167	0.208	0.251	0.500	0.333	0.333	0.167	0.500	0.417	0.32	2.
3.	0.667	0.000	0.667	0.166	0.667	0.000	0.000	0.667	0.500	0.37	3.
4.	1.000	0.000	1.000	0.500	0.500	0.000	0.833	0.667	0.500	0.56	4.
5.	0.333	0.000	0.445	0.027	0.000	0.000	0.111	0.667	0.000	0.18	5.
6.	0.667	0.000	0.667	0.500	0.000	0.167	0.500	0.000	0.000	0.28	6.
7.	0.000	0.000	0.000	0.667	0.000	0.000	0.500	1.000	0.667	0.32	7.
8.	0.000	0.000	0.500	0.500	0.417	0.333	0.500	0.333	0.333	0.32	8.
9.	0.667	0.000	0.667	0.500	0.166	0.166	0.166	0.333	0.333	0.33	9.
10.	0.000	0.000	0.000	0.000	0.000	0.000	0.166	0.667	0.166	0.11	10.
11.	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.000	0.167	0.09	11.
12.	0.867	0.000	0.534	0.567	0.534	0.534	0.833	0.534	0.567	0.55	12.
13.	0.000	(0.167)	0.000	0.500	0.166	0.000	0.600	0.500	0.500	0.25	13.
14.	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.667	0.13	14.
15.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.07	15.



Table 1 A.

TAXONOMICAL DISTANCES BETWEEN SUPPORTING FORCES															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	.000	.329	.426	.463	.497	.407	.444	.361	.389	.463	.482	.319	.382	.519	.574
2.	.329	.000	.282	.356	.261	.319	.282	.144	.190	.246	.338	.279	.182	.245	.301
3.	.436	.282	.000	.222	.164	.315	.389	.306	.185	.296	.426	.270	.326	.352	.333
4.	.463	.356	.222	.000	.380	.315	.389	.306	.259	.444	.462	.159	.304	.463	.519
5.	.497	.261	.164	.380	.000	.250	.312	.296	.268	.114	.244	.406	.286	.300	.250
6.	.407	.319	.315	.315	.250	.000	.370	.231	.130	.352	.259	.304	.307	.296	.352
7.	.444	.282	.389	.389	.312	.370	.000	.268	.352	.204	.259	.385	.122	.185	.240
8.	.361	.144	.306	.306	.296	.231	.268	.000	.176	.287	.268	.228	.169	.269	.324
9.	.389	.190	.185	.259	.268	.130	.352	.176	.000	.296	.352	.130	.252	.278	.333
10.	.463	.246	.296	.444	.114	.352	.204	.287	.296	.000	.130	.471	.178	.204	.148
11.	.482	.338	.426	.462	.244	.259	.259	.268	.352	.130	.000	.460	.174	.185	.130
12.	.319	.279	.270	.159	.406	.304	.385	.228	.130	.471	.460	.000	.300	.445	.500
13.	.382	.182	.326	.304	.286	.307	.122	.169	.252	.178	.174	.300	.000	.159	.215
14.	.519	.245	.352	.463	.300	.296	.185	.269	.278	.204	.185	.445	.159	.000	.055
15.	.574	.301	.333	.519	.250	.352	.240	.324	.333	.148	.130	.500	.215	.055	.000
<b>mean</b>	.43	.27	.31	.36	.29	.30	.30	.26	.26	.27	.30	.33	.24	.28	.30





Table 2

Differences between the weights of **blocking** force within two subpopulations according to distinguished features (attributes) determining the division of society

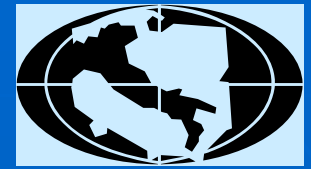
S E C T I O N S											
Existential				Labour			Educational socio-cultural				
No	1	2	3	1	2	3	1	2	3	dw	No
1.	0.667	1.000	0.000	0.667	0.667	0.667	0.500	0.500	0.166	0.54	1
2.	0.167	0.208	0.251	0.500	0.333	0.333	0.167	0.500	0.417	0.32	2
3.	0.667	0.000	0.667	0.166	0.667	0.000	0.000	0.667	0.500	0.37	3
4.	1.000	0.000	1.000	0.500	0.500	0.000	0.833	0.667	0.500	0.56	4
5.	0.333	0.000	0.445	0.027	0.000	0.000	0.111	0.667	0.000	0.18	5
6.	0.667	0.000	0.667	0.500	0.000	0.167	0.500	0.000	0.000	0.28	6
7.	0.000	0.000	0.000	0.667	0.000	0.000	0.500	1.000	0.667	0.32	7
8.	0.000	0.000	0.500	0.500	0.417	0.333	0.500	0.333	0.333	0.32	8
9.	0.667	0.000	0.667	0.500	0.166	0.166	0.166	0.333	0.333	0.33	9
10.	0.000	0.000	0.000	0.000	0.000	0.000	0.166	0.667	0.166	0.11	10
11.	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.000	0.167	0.09	11
12.	0.867	0.000	0.534	0.567	0.534	0.534	0.833	0.534	0.567	0.55	12
13.	0.000	(0.167)	0.000	0.500	0.166	0.000	0.600	0.500	0.500	0.25	13
14.	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.667	0.13	14
15.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.07	15



Table 2A



TAXONOMICAL DISTANCES $\{d\}$ BETWEEN BLOCKING FORCES															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	.000	.329	.426	.463	.497	.407	.444	.361	.389	.463	.482	.319	.382	.519	.574
2.	.329	.000	.282	.000	.262	.222	.444	.380	.241	.222	.259	.374	.204	.333	.370
3.	.407	.185	.000	.240	.170	.278	.352	.324	.148	.055	.093	.359	.111	.240	.240
4.	.463	.240	.240	.000	.293	.333	.407	.250	.278	.259	.259	.193	.204	.296	.370
5.	.442	.262	.170	.293	.000	.312	.386	.377	.146	.201	.238	.323	.145	.275	.127
6.	.351	.222	.278	.333	.312	.000	.222	.306	.259	.296	.296	.408	.241	.111	.333
7.	.278	.444	.352	.407	.386	.222	.000	.250	.352	.371	.370	.422	.315	.185	.333
8.	.268	.380	.330	.250	.377	.306	.250	.000	.287	.306	.324	.321	.287	.250	.380
9.	.296	.241	.148	.278	.146	.259	.352	.287	.000	.129	.204	.345	.073	.240	.204
10.	.389	.222	.055	.259	.201	.296	.371	.306	.129	.000	.074	.378	.129	.259	.259
11.	.426	.259	.093	.259	.238	.296	.370	.324	.204	.074	.000	.311	.129	.185	.185
12.	.508	.374	.359	.193	.323	.408	.422	.321	.345	.378	.311	.000	.300	.304	.274
13.	.296	.204	.111	.204	.145	.241	.315	.287	.073	.129	.129	.300	.000	.204	.166
14.	.315	.333	.240	.296	.275	.111	.185	.250	.240	.259	.185	.304	.204	.000	.222
15.	.389	.370	.240	.370	.127	.333	.333	.380	.204	.259	.185	.274	.166	.222	.000
<b>mean</b>	.37	.40	.25	.29	.26	.28	.33	.31	.23	.24	.24	.34	.19	.24	.28



Taxonomical analysis of differences between levels of influence allows to separate the groups of similar force on the level of similarity  $1 - d = 0,8$  of positive influence as well as of negative one. It can be observed that features: health status and, literacy have prevalent blocking influence over supporting, also - former residence and worship. Relatively - feature marital status has prevalent supporting influence over blocking.

Differences of influence force make possible to choice the proper cartographic means to organize differently perceived layers of map' contents. It is evident that in studies of blocking or supporting forces of preservation of human rights just the features of the strong influence may have priority as determining basic social divisions.



## CONCLUSION

Development of disciplines is a process of interrelations between specific methods, means and manners of presenting the scientific results. Relations between socio-demography and cartography may served as an example of many difficulties and real barriers which have to be overcome on the way to rich the next step of science.

To day the possible strategy for cartographers seems be creating several types of maps with intentionally chosen or transformed data and next – convicting people interested in socio-demographical problems (scientists, politics, economists and members of regional as well as global organizations) of effectiveness of deduction about spatial properties – on the base of visually observed model of states, changes or processes.

Methodology proposed in the paper may be applied in analysis separately treated sectors or junction of purposely chosen group of condition of human rights preservation. In each case the list of features should be limited to these having influence on at least one of condition of studied rights.

