ACTA SCIENTIARUM POLONORUM

Czasopismo naukowe założone w 200l roku przez polskie uczelnie rolnicze

Oeconomia

Economics

Ekonomia

10 (1) 2011

Bydgoszcz Kraków Lublin Olsztyn
Poznań Siedlce Szczecin Warszawa Wrocław

ISSN 1644-0757

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Print: Agencja Reklamowo-Wydawnicza A. Grzegorczyk, www.grzeg.com.pl

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ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 5–19*

THE DISTRIBUTION OF SOCIAL SECURITY PAYMENTS AMONG REGIONS OF POLAND – COMPARATIVE ANALYSIS

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Abstract. The paper presents description and comparison of old-age pensions, disability pensions in case of inability to work and survivor's pensions for agricultural and employees' social insurance systems. Research was conducted among regions of Poland in 2008. In the study data of the Agricultural Social Insurance Fund and the Social Insurance Institution, as well as sources of widely available domestic statistics were used. The study employed basic measures of descriptive statistics. In the agricultural social security system there is a serious imbalance of the relationship between the insured and the beneficiaries. This situation indicates the need to subsidize the system in the future. The agricultural pensions are paid at the lowest amount in a substantial part of provinces. Average monthly pensions paid by ASIF in 2008 was almost a half lower than the employee pension. All pensions, both for employee's and farmer's, were lower than the average wage in provinces.

Key words: social security payments, Agricultural Social Insurance Fund, Social Insurance Institution

INTRODUCTION

In Poland there are two social insurance systems. One of them is the universal system, tasks of which are performed by the Social Insurance Institution (SII) (Polish name Zakład Ubezpieczeń Społecznych, abbreviation ZUS). The second system is the system of insurance directed mainly to farmers and members of the household who live at a farm. The duties of the latter are fulfilled by the Agricultural Social Insurance Fund (ASIF) (Polish name, Kasa Rolniczego Ubezpieczenia Społecznego, abbreviation KRUS). The farm holders covered by Agricultural Social Insurance Fund pay the quarterly lower social-security insurance contribution, than people who are employed or run the non-agri-

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cultural business activity. In the same time, the average monthly social security benefits from the agricultural social insurance system are significantly lower than benefits from SII. Benefits entitled from the social security insurance, both as part of the employees', as well as agricultural insurance system, include among others: old-age pensions, pensions on account of the inability to work and survivor's pensions [Bobola 2008, Łuczka-Bakuła, Jabłońska-Porzuczek 2008, Podstawka 2008, Wasilewski, Charemski 2006].

The main purpose of the study was to determine and to compare the level of social security benefits for the agricultural and employees' social insurance system among provinces of Poland in 2008. The analysis relies on the comparison of benefits paid by ASIF versus Social Insurance Institution. For each of the systems the relations between the number of currently paid pensions to the number of insured people has been defined. The study also identifies the level of pensions on the background of the minimal wage, average wage in 2008, as well as the average monthly available income per capita in employees and farmers household.

MATERIALS AND METHODS

The subject of the research was the level of: old-age pensions, pensions in case of inability to work (disability pensions) and survivor's pensions paid as a part of the agricultural and employees' social insurance system. The research was conducted among provinces in Poland in 2008 (separate units at NUTS 2). The data of the Agricultural Social Insurance Fund "Kwartalna informacja statystyczna. IV kwartał 2008 r." and the Social Insurance Institution "Informacja o świadczeniach pieniężnych z Funduszu Ubezpieczeń Społecznych oraz niektórych świadczeniach z ubezpieczenia społecznego", as well as the sources of widely available domestic statistics were used.

The study employed basic measures of descriptive statistics. The level of differentiation of the tested pension benefits among regions has been established with the use of the variation coefficient (v). Moreover, the separate types of pensions have been classified with using the simple grouping scheme, involving the construction of frequency distribution. As a result the considered regions were classified on the basis of the amount of paid benefits. Such classification allows to determine the accuracy of the distribution of the benefits among regions, as well as the comparison between the employees and the agricultural social security system.

In order to deepen the analysis, the indicators illustrating the number of pensions in relation to the number of insured people, the level of types of social security benefits on the minimum wage and average salary in 2008 (%), as well as the share of types of social security benefits in the average monthly per capita available income in employees and farmers household in 2008 (%) were conducted.

RESULTS

The average monthly number of pensions in total from employees' social insurance system was 7413.7 thousand in 2008. So it was almost five times higher than the number of such benefits paid by the Agricultural Social Insurance Fund (Table 1). Also the

Table 1. Average monthly number of pensions and the number of insured in SII and ASIF according to provinces in 2008 (in thousands)

Tabela 1. Przeciętna miesięczna liczba emerytur i rent oraz osób ubezpieczonych w ZUS i KRUS według województw w 2008 roku (w tys.)

Details Wyszczególnienie	Number of pensions Liczba emerytur I rent		Number of insured[a)] Liczba ubezpieczonych[a)]		Number of pensions per one insured person Liczba emerytur i rent na osobę ubezpieczoną	
	SII/ZUS	ASIF/ /KRUS	SII/ZUS[b)]	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS
TOTAL/ OGÓŁEM	7413.7[c)]	1477.7[d)]	14925.7	1574.4	2.01	1.07
Dolnośląskie	617.0	62.0	1165.1	64.4	1.89	1.04
Kujawsko-pomorskie	381.7	89.6	813.2	93.8	2.13	1.05
Lubelskie	354.2	197.8	711.0	184.7	2.01	0.93
Lubuskie	199.7	25.6	412.8	20.6	2.07	0.80
Łódzkie	532.9	125.5	1011.7	130.6	1.90	1.04
Małopolskie	644.9	113.8	1171.0	166.4	1.82	1.46
Mazowieckie	951.3	222.8	2161.7	223.6	2.27	1.00
Opolskie	183.3	33.4	350.0	42.0	1.91	1.26
Podkarpackie	382.5	99.3	710.8	104.7	1.86	1.05
Podlaskie	171.4	104.6	378.8	111.0	2.21	1.06
Pomorskie	412.1	45.3	886.2	52.5	2.15	1.16
Śląskie	1127.7	51.5	1834.3	49.0	1.63	0.95
Świętokrzyskie	236.1	81.1	440.6	86.9	1.87	1.07
Warmińsko-mazurskie	248.6	53.5	559.7	55.1	2.25	1.03
Wielkopolskie	635.9	133.2	1342.7	153.3	2.11	1.15
Zachodniopomorskie	334.7	35.1	684.8	35.8	2.05	1.02

a) On the 31.12.2008.

b) Without senior citizens and pensioners, people receiving benefits and pre-retirement benefits and people receiving social pensions. Including the number of insured who were not assigned to individual provinces. Assigning to provinces on the basis of the reported place of residence of the insured.

c) Without pensions carried out on the legal validity of international agreements, without pensions for people with the right also to the agricultural benefit and without injury pensions financed from FIS but paid by the MOND, MIA, MJ. Assigned to the province according to the office of the SII branch carrying out the payment of the pension for the particular beneficiary.

d) Including 'GBRZ' and pensions financed by PF, but paid by the MOND, MIA, MJ in the concurrence with benefits financed from budget of MOND, MIA, MJ.

a) Na dzień 31.12.2008r.

b) Bez emerytów i rencistów, osób pobierających zasiłki i świadczenia przedemerytalne oraz osób pobierających renty socjalne. Łącznie z liczbą ubezpieczonych, którzy nie zostali przypisani do poszczególnych województw. Przyporządkowanie do województw na podstawie miejsca zameldowania ubezpieczonego.

c) Bez emerytur i rent realizowanych na mocy umów międzynarodowych, bez emerytur i rent osób posiadających prawo także do świadczenia rolniczego oraz bez rent wypadkowych finansowanych z FUS, a wypłacanych przez MON, MSWiA, MS. Przyporządkowane do województwa według siedziby oddziału ZUS dokonującego wypłaty emerytury bądź renty dla danego świadczeniobiorcy.

d) Łącznie z GBRZ oraz emeryturami finansowanymi z FER, a wypłaconymi przez MON, MSWiA, MS w zbiegu ze świadczeniami finansowanymi z budżetu MON, MSWiA, MS.

Source: Own elaboration based on: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Źródło: Opracowanie własne na podstawie: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

number of insured in SII in 2008 significantly exceeded the number of insured in ASIF (over nine times). In both systems, the number of pensions was lower than the number of insured persons. This situation should be regarded as favorable, because there are more contributors than the recipients of benefits. However, it should be noted, that the ratio of the number of pensioners in relation to the number of insured persons in social insurance system amounted to 2.01, while in the case of benefits paid by ASIF, this factor was equal to 1.07 (Table 1). A growing number of persons receiving agricultural pensions, with constant or declining number of paying the insurance premium will cause the pension system of agricultural insurance to be more vulnerable to the reduction of revenues from contributions.

The provinces which stand out from others, as far as the average monthly number of pensions from SII in 2008 is concerned, were: Śląskie and Mazowieckie. The number of benefits in these regions was: 1127.7 thousand and 951.3 thousand appropriately, that is over five times more than for example in Podlaskie (171.4 thousand). Also in those provinces there were the highest number of insured persons. The lowest number of the average monthly number of pensions, workers' pensions and the number of insured were characterizing such provinces as: Lubuskie, Opolskie and Podlaskie (Table 1).

Average monthly number of pensions in total, paid by the Agricultural Social Insurance Fund in 2008 was 1477.7 thousand while the number of insured persons was 1574.4 thousand (Table 1). The highest number of social security benefits from the agricultural social insurance system was paid in provinces Mazowieckie and Lubelskie. These provinces were also characterized by the highest number of insured (Table 1). Moreover in such provinces as: Łódzkie, Małopolskie, Podlaskie and Wielkopolskie the average monthly number of pensions in the examined year exceeded 100 thousand. The lowest average monthly number of analyzed benefits and the number of insured were characterizing such regions as: Lubuskie, Opolskie and Zachodniopomorskie (Table 1).

Analyzing the individual forms of social security benefits it is possible to conclude that in case of both social insurance system old-age pensions are the highest share of the whole benefits. In turn survivor's pensions, represented the smallest share. The attention should be paid to the fact that the survivor's pensions from the agricultural insurance system constituted only 3.0% of the whole number of benefits, however that from SII – over 17% (Figure 1). Such a large difference in the allocation of the survivors may be due to the fact, that a large number of farmers also work outside agriculture, e.g. as a teachers, skilled workers or non-agricultural business owners. Such persons are normally subject to social security insurance [Fedyszak-Radziejowska 2010]. Overload of professional responsibilities, poor working conditions are often conducive to cause an accident, diseases and often death. Hence, in the case of the employee pension insurance, the share of paid survivors is higher than in that addressed to farmers agriculture. A small percentage of survivors' pensions paid under the Act on the social insurance for farmers may be also caused by relatively low age of farmers who apply for a pension.

The average number of agricultural old-age pensions in total in 2008 was over four times lover that the number of such pensions paid off from SII. In the case of disability pensions, ASIF paid over five time less that SII, whereas the survivors' pensions – over 29-times (Table 2).

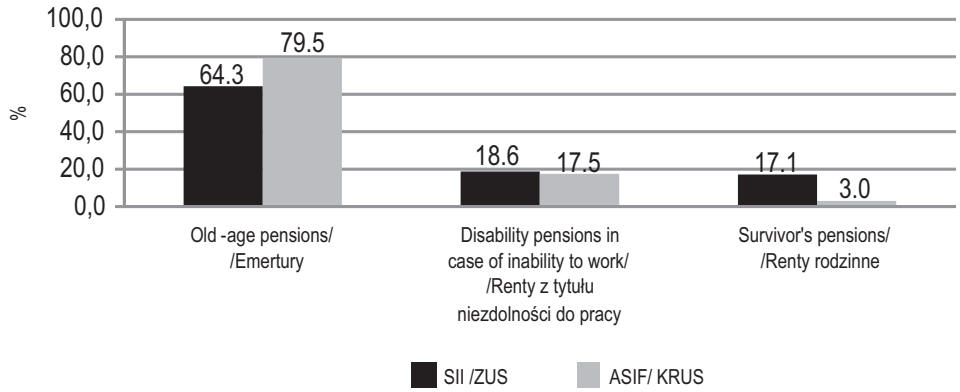

Fig. 1. The structure of social security benefits from SII and ASIF for 2008
Rys. 1. Struktura świadczeń emerytalno-rentowych z ZUS i KRUS w 2008 roku
Source: Own elaboration based on Table 2.
Źródło: Opracowanie własne na podstawie tabeli 2.

The highest number of old-age pensions paid off by SII was noted in 2008 in Śląskie (723 thousand) and Mazowieckie (670 thousand). This follows the fact that both provinces belong to the most populous regions in Poland (over 25% of the total population of the country in 2008 came from these regions [Rocznik Satystyczny Województw 2008]. In remaining provinces the number of old-age pensions from SII was fluctuating between 118 thousand in Podlaskie and 407 thousand in Dolnośląskie. In 2008 the highest number of old-age pensions from the agricultural social insurance system (on average above 100.0 thousand monthly) was paid in provinces: Mazowieckie, Lubelskie and Łódzkie. In turn the lowest number of old-age pensions paid from ASIF (below 30.0 thousand) was registered in such provinces as: Lubuskie, Opolskie and Zachodniopomorskie (Table 2).

In 2008 the highest number of disability pensions paid by SII was registered in such provinces as: Śląskie, Wielkopolskie, Mazowieckie, Małopolskie and Dolnośląskie. Provinces Opolskie and Podlaskie indicated the lowest number of such benefits (below 30.0 thousand). Then, in such provinces as Lubelskie and Mazowieckie average number of agricultural disability pensions was exceeding 30.0 thousand. In turn, the average number of such benefits was not higher than 5.0 thousand in Lubuskie and Opolskie (Table 2).

The survivor's pensions are benefits which have the smallest participation in the whole number of social security benefits paid from Agricultural Social Insurance Fund. In 2008 the average monthly number of survivors' pensions was fluctuating from 0.1 thousand in Śląskie to 7.4 thousand in Mazowieckie. It is worth to notice that in case of survivors' pensions paid off by SII, particularly in Śląskie the highest average number of such benefits (218.5 thousand) was observed. Besides, in such provinces as: Dolnośląskie, Małopolskie, Mazowieckie and Wielkopolskie, number of workers' survivors' pensions exceeded 100.0 thousand. The lowest number of survivors' pensions

Table 2. The monthly number of social security benefits from SII and ASIF according to the provinces in 2008 (in thousands)

Tabela 2. Miesięczna liczba i rodzaje świadczeń emerytalno-rentowych z ZUS i KRUS według województw w 2008 roku (w tys.)

Details Wyszczególnienie	Old-age pensions Emerytury		Disability pensions in case of inability to work Renty z tytułu niezdolności do pracy		Survivor's pensions Renty rodzinne	
	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS
TOTAL/ OGÓŁEM	4765.3[a)]	1175.2[b)]	1380.8[a)]	258.4[b)]	1267.6[a)]	43.7[b)]
Dolnośląskie	406.6	49.8	109.4	10.5	101.0	1.7
Kujawsko-pomorskie	236.0	66.8	75.7	19.8	70.0	3.0
Lubelskie	209.5	152.5	90.2	40.2	54.5	5.2
Lubuskie	119.3	20.4	48.8	4.6	31.6	0.6
Łódzkie	368.7	103.9	81.0	17.7	83.2	3.9
Małopolskie	400.6	87.2	135.1	23.6	109.2	2.9
Mazowieckie	670.3	183.0	136.2	32.4	144.8	7.4
Opolskie	128.4	29.5	22.0	3.1	32.8	0.8
Podkarpackie	237.1	79.7	81.2	17.3	64.2	2.3
Podlaskie	118.4	87.4	27.3	14.0	25.7	3.3
Pomorskie	260.7	32.6	76.2	11.0	75.2	1.7
Śląskie	723.0	45.8	186.2	5.6	218.5	0.1
Świętokrzyskie	152.4	66.8	40.8	12.0	42.9	2.3
Warmińsko-mazurskie	151.4	41.0	54.7	10.4	42.5	2.1
Wielkopolskie	369.6	99.0	149.1	29.7	117.2	4.6
Zachodniopomorskie	213.5	27.6	67.0	6.6	54.2	1.0

[a)] Without pensions carried out on the legal validity of international agreements, without pensions for people with the right also to the agricultural benefit and without injury pensions financed from FIS but paid by the MOND, MIA, MJ. Assigned to the province according to the office of the SII branch carrying out the payment of the pension for the particular beneficiary.

[b)] Including pensions financed from the PF, but paid by the MOND, MIA, MJ in concurrence with the benefits financed from the budget of MOND, MIA, MJ.

[a)] Bez emerytur i rent realizowanych na mocy umów międzynarodowych, bez emerytur i rent osób posiadających prawo także do świadczenia rolniczego oraz bez rent wypadkowych finansowanych z FUS, a wypłacanych przez MON, MSWiA, MS. Przyporządkowane do województwa według siedziby oddziału ZUS dokonującego wypłaty emerytury bądź renty dla danego świadczeniobiorcy.

[b)] Łącznie z emeryturami finansowanymi z FER, a wypłaconymi przez MON, MSWiA, MS w zbiegu ze świadczeniami finansowanymi z budżetu MON, MSWiA, MS.

Source: Own elaboration based on: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Źródło: Opracowanie własne na podstawie: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

from SII, similarly like old-age pensions and disability pensions, was paid in Podlaskie (25.7 thousand) (Table 2).

The amount of average monthly old-age pensions in total number of pensions paid by SII was 1471 PLN in 2008, and it was about twice higher than the agricultural old-age pensions (746 PLN). In the case of social security payments, similar tendency was observed. The employees' disability pension in total from SII was the 162.2% of the pension from the ASIF. In turn, the average monthly survivor's pension in total from the Agricultural Social Insurance Fund in 2008 was 774 PLN, i.e. about 60.0% of the employees' survivor's pension (1292 PLN) (Table 3). Pensions paid by ASIF, appear to be significantly lower than those offered within the occupational social security system.

Regional diversity of the average monthly old-age pension from the Agricultural Social Insurance Fund and SII in 2008 among provinces was smaller (the coefficient of variation was appropriately: 3.6% and 8.8%). The amounts of the old-age pension from the Agricultural Social Insurance Fund have fluctuated from 666 PLN in Śląskie to 769 PLN in Podlaskie. In case of average monthly old-age pension paid from SII, only in Mazowieckie and Śląskie these amounts were higher than in total and were appropriately: 1509 PLN and 1811 PLN. It should be noticed that Śląskie was characterized by the lowest monthly average agricultural old-age pension and simultaneously with the highest occupational old-age pensions (almost three times higher) (Table 3).

The level of average monthly disability pensions in ASIF was very similar among regions in 2008 (v = 1.9%). The highest pension amounted 703 PLN (Opolskie), whereas the lowest 660 PLN (Mazowieckie). In the case of average monthly disability pensions from SII, it was possible to observe the significant differences in amounts of this benefit among provinces. Those values fluctuated from 918 PLN in Podkarpackie to 1443 PLN in Śląskie (table 3). The levels of variability of the employees' disability pensions and survivors pensions were similar in particularly provinces (appropriately v = 11.9%, v = 11.1%). The lowest survivors pensions were paid in Podkarpackie (1091 PLN), and highest in Śląskie (1670 PLN). The level of survivors' pensions paid by ASIF, characterized a twice as less variations in the regional coverage of the country (v = 5.3%). The difference between the highest and the lowest agricultural survivor's pension was approximately 22% (Table 3).

In case of average monthly social security benefits paid by SII in 2008, a certain number of specific relations was noticed in their regional layout. Provinces were characterized by a comparatively permanent membership in the particular class interval, determining the level of examined benefits. For example, Dolnośląskie, Pomorskie and Śląskie were standing out the most often with the highest average pensions from SII. Then, such regions as: Lubelskie, Lubuskie, Podkarpackie, Podlaskie, Świętokrzyskie and Warmińsko-Mazurskie were the provinces in which the level of social security benefits was usually very low. In these provinces the old-age pensions did not exceed 1364 PLN, disability pensions 996 PLN, and the survivors' pensions were lower than 1160 PLN (Table 4).

In case of agricultural old-age pensions, their highest level (which exceeded 769 PLN) occurred in Podlaskie and Warmińsko-Mazurskie. Next, the highest disability pensions

Table 3. Average monthly social security benefits from SII and ASIF[a)] according to provinces in 2008 (in PLN)

Tabela 3. Przeciętne miesięczne świadczenia emerytalno-rentowe z ZUS i KRUS[a)] według województw w 2008 roku (w zł)

Details Wyszczególnienie	Old-age pensions Emerytury		Disability pensions in case of inability to work Renty z tytułu niezdolności do pracy		Survivor's pensions Renty rodzinne	
	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS
TOTAL/ OGÓŁEM	1471.3[b)]	745.6[c)]	1096.4[b)]	675.8[c)]	1292.1[b)]	774.1[c)]
Dolnośląskie	1462.5	724.9	1211.8	696.9	1317.0	814.1
Kujawsko-pomorskie	1381.6	764.8	957.8	683.6	1181.7	822.5
Lubelskie	1319.5	757.3	995.8	687.1	1107.4	788.8
Lubuskie	1345.5	700.9	1036.3	694.0	1157.5	810.5
Łódzkie	1371.6	750.9	954.4	668.2	1183.5	790.8
Małopolskie	1421.6	727.8	1104.2	662.7	1251.2	740.8
Mazowieckie	1509.2	761.9	1042.8	660.1	1248.4	749.8
Opolskie	1411.1	737.6	1117.1	703.0	1235.5	776.5
Podkarpackie	1272.3	734.2	918.4	678.7	1091.7	752.8
Podlaskie	1315.9	769.1	1046.1	671.2	1119.4	775.1
Pomorskie	1460.2	747.5	1122.5	668.4	1280.3	777.4
Śląskie	1811.0	666.0	1442.6	674.8	1670.6	741.4
Świętokrzyskie	1321.1	740.1	970.2	665.6	1130.7	759.8
Warmińsko-mazurskie	1346.4	768.8	997.8	687.7	1137.1	767.9
Wielkopolskie	1431.2	745.8	1017.4	673.7	1237.4	750.0
Zachodniopomorskie	1424.5	745.5	1078.6	693.4	1229.8	907.1

a) Without payments from other insurance systems in case of the concurrence of entitlements to benefits from these systems with entitlements to benefits from the social security fund.

b) Without pensions carried out on the legal validity of international agreements, without pensions for people with the right also to the agricultural benefit and without injury pensions financed from FIS but paid by the MOND, MIA, MJ. Assigned to the province according to the office of the SII branch carrying out the payment of the pension for the particular beneficiary.

c) Including pensions financed from the PF, but paid by the MOND, MIA, MJ in concurrence with the benefits financed from the budget of MOND, MIA, MJ.

a) Bez wypłat z innych systemów ubezpieczeniowych w przypadku zbiegu uprawnień do świadczeń z tych systemów z uprawnieniami do świadczeń z funduszu emerytalno-rentowego.

b) Bez emerytur i rent realizowanych na mocy umów międzynarodowych, bez emerytur i rent osób posiadających prawo także do świadczenia rolniczego oraz bez rent wypadkowych finansowanych z FUS, a wypłacanych przez MON, MSWiA, MS. Przyporządkowane do województwa według siedziby oddziału ZUS dokonującego wypłaty emerytury bądź renty dla danego świadczeniobiorcy.

c) Łącznie z emeryturami finansowanymi z FER, a wypłaconymi przez MON, MSWiA, MS w zbiegu ze świadczeniami finansowanymi z budżetu MON, MSWiA, MS.

Source: Own elaboration based on: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Źródło: Opracowanie własne na podstawie: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Table 4. Average monthly social security benefits paid from SII according to provinces in 2008 (in PLN)

Tabela 4. Przeciętne miesięczne świadczenia emerytalno-rentowe wypłacane przez ZUS według województw w 2008 roku (w zł)

Social security benefits paid from SII (in PLN) Świadczenia emerytalno--rentowe wypłacane przez ZUS (w zł)	Number of provinces Liczba województw	Percentage of provinces Odsetek województw	Provinces Województwa
Old-age pensions/ Emerytury			
< 1364.2	6	37.5	lubelskie, lubuskie, podkarpackie, podlaskie, świętokrzyskie, warmińsko-mazurskie
< 1364.2–1412.5)	3	18.75	kujawsko-pomorskie, łódzkie, opolskie
<1412.5–1460.9)	4	25.00	małopolskie, pomorskie, wielkopolskie, zachodniopomorskie
< 1460.9–1509.2)	1	6.25	dolnośląskie,
> 1509.2	2	12.50	mazowieckie, śląskie
Total/ Suma	16	100.00	
Disability pensions in case of inability to work/ Renty z tytułu niezdolności do pracy			
< 996.4	5	31.25	kujawsko-pomorskie, lubelskie, łódzkie, podkarpackie, świętokrzyskie
< 996.4–1038.4)	3	18.75	lubuskie, warmińsko-mazurskie, wielkopolskie
< 1038.4–1080.5)	3	18.75	mazowieckie, podlaskie, zachodniopomorskie
< 1080.5–1122.5)	2	12.50	małopolskie, opolskie
> 1122.5	3	18.75	dolnośląskie, pomorskie, śląskie
Total/ Suma	16	100.00	
Survivor's pensions/ Renta rodzinna			
< 1159.9	6	37.50	lubelskie, lubuskie, podkarpackie, podlaskie, świętokrzyskie, warmińsko-mazurskie
< 1159.9–1212.2)	2	12.50	kujawsko-pomorskie, łódzkie,
< 1212.2–1232.5)	1	6.25	zachodniopomorskie
< 1232.5–1252.7)	4	25.00	małopolskie, mazowieckie, podkarpackie, wielkopolskie
> 1252.7	3	18.75	dolnośląskie, pomorskie, śląskie
Total/ Suma	16	100.00	

Source: Own elaboration based on Table 3.
Źródło: Opracowanie własne na podstawie Tabeli 3.

appeared in such provinces as: Dolnośląskie and Opolskie (above 697 PLN), whereas the survivor's pensions in: Kujawsko-Pomorskie and Zachodniopomorskie (higher than 822 PLN) (Table 5).

In order to deepen the analyses, the rates depicting the share of individual types of social security benefits in minimal wage in 2008 were calculated. Old-age pensions paid by SII in all provinces were higher than the minimum wage. The highest rate was noted in Śląskie (160.8%), and the lowest – in Podkarpackie (113.0%). In case of disability pensions paid by SII, only in Dolnośląskie benefits were higher than the minimal wage appropriately about 7.6% and in Śląskie – about 28.1%. In turn, employees' survivor's

Table 5. Average monthly social security benefits paid from ASIF according to the provinces in 2008 (in PLN)

Tabela 5. Przeciętne miesięczne świadczenia emerytalno-rentowe wypłacane przez KRUS według województw w 2008 roku (w zł)

Social security benefits paid from ASIF (in PLN) Świadczenia emerytalno--rentowe wypłacane przez KRUS (w zł)	Number of provinces Liczba województw	Percentage of provinces Odsetek województw	Provinces Województwa
Old-age pensions/Emerytury			
< 719.9	2	12.50	śląskie, lubuskie
< 719.9–734.9)	3	18.75	dolnośląskie, małopolskie, podkarpackie
< 734.9–751.8)	6	37.50	łódzkie, opolskie, pomorskie, świętokrzyskie, wielkopolskie, zachodniopomorskie
< 751.8–768.8)	3	18.75	kujawsko-pomorskie, lubelskie, mazowieckie,
> 768.8	2	12.50	podlaskie, warmińsko-mazurskie
Total/ Suma	16	100.00	
Disability pensions in case of inability to work/Renty z tytułu niezdolności do pracy			
< 671.2	5	31.25	łódzkie, małopolskie, mazowieckie, pomorskie, świętokrzyskie
< 671.2–679.8)	4	25.00	podkarpackie, podlaskie, śląskie, wielkopolskie
< 679.8–688.4)	3	18.75	kujawsko-pomorskie, lubelskie, warmińsko--mazurskie
< 688.4–696.9)	2	12.50	lubuskie, zachodniopomorskie
> 696.9	2	12.50	dolnośląskie, opolskie
Total/ Suma	16	100.00	
Survivor's pensions/Renta rodzinna			
< 761.7	6	37.50	małopolskie, mazowieckie, podkarpackie, śląskie, świętokrzyskie, wielkopolskie
< 761.7–782.0)	4	25.00	opolskie, podlaskie, pomorskie, warmińsko-mazurskie
< 782.0–802.3)	2	12.50	lubelskie, łódzkie
< 802.3–822.5)	2	12.50	dolnośląskie, lubuskie
> 822.5	2	12.50	kujawsko-pomorskie, zachodniopomorskie
Total/ Suma	16	100.00	

Source: Own elaboration based on Table 3.
Źródło: Opracowanie własne na podstawie tabeli 3.

pensions in majority of provinces exceeded the amount of the minimal wage in 2008. The exceptions were in Lubelskie (the rate was 98.4%), Podkarpackie (the rate was 97.0%) and Podlaskie (99.4%) (Table 6). All social security benefits paid from agricultural social insurance system were lower than the minimal wage (agricultural old-age pensions about 30–40%, disability pensions about 38–41 %, and survivor's pensions about 20–35%) (Table 6).

Amounts of individual social security benefits paid by ASIF and SII were also compared to the amount of average salary in 2008. It was possible to state, on the basis of data presented in Table 7, that all social security benefits, both as part of the agricultural,

Table 6. Average monthly social security benefits paid from SII and ASIF according to the provinces in 2008 (in % of the minimal wage[a)])

Tabela 6. Przeciętne miesięczne świadczenia emerytalno-rentowe wypłacane przez ZUS i KRUS według województw w 2008 roku (w % płacy minimalnej[a)])

Details Wyszczególnienie	Old-age pensions Emerytury		Disability pensions in case of inability to work /Renty z tytułu niezdolności do pracy		Survivor's pensions Renty rodzinne	
	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS
	in % of the minimal wage/ w % płacy minimalnej					
Dolnośląskie	129.9	64.4	107.6	61.9	117.0	72.3
Kujawsko-pomorskie	122.7	67.9	85.1	60.7	104.9	73.1
Lubelskie	117.2	67.3	88.4	61.0	98.4	70.1
Lubuskie	119.5	62.3	92.0	61.6	102.8	72.0
Łódzkie	121.8	66.7	84.8	59.3	105.1	70.2
Małopolskie	126.3	64.6	98.1	58.9	111.1	65.8
Mazowieckie	134.0	67.7	92.6	58.6	110.9	66.6
Opolskie	125.3	65.5	99.2	62.4	109.7	69.0
Podkarpackie	113.0	65.2	81.6	60.3	97.0	66.9
Podlaskie	116.9	68.3	92.9	59.6	99.4	68.8
Pomorskie	129.7	66.4	99.7	59.4	113.7	69.0
Śląskie	160.8	59.2	128.1	59.9	148.4	65.8
Świętokrzyskie	117.3	65.7	86.2	59.1	100.4	67.5
Warmińsko-mazurskie	119.6	68.3	88.6	61.1	101.0	68.2
Wielkopolskie	127.1	66.2	90.4	59.8	109.9	66.6
Zachodniopomorskie	126.5	66.2	95.8	61.6	109.2	80.6

a) The minimum wage in 2008 was 1126.0 PLN (Rozporządzenie Rady Ministrów…).

b) Minimalna płaca w 2008 roku wynosiła 1126,0 zł (Rozporządzenie Rady Ministrów…).

Source: Own elaboration based on: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Źródło: Opracowanie własne na podstawie: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

as well as employees' social insurance system, were lower than average remuneration in individual provinces in 2008.

Agricultural old-age pensions constituted from about 23% to about 26% of average salary in 2008. While occupational old-age pensions – from about 43% to about 62% of the remuneration. It was possible to state, in case of disability pensions paid from ASIF, that their level was shaped at 23% of average salary. The same benefits, but paid as a part of the employees' social insurance system were more diversified in provinces. Their amount fluctuated from 31% of average salary in Podkarpackie to 49% in Śląskie. The situation was similar in case of employees' survivors' pensions. Their average monthly level was about 37% of average salary in Podkarpackie and almost 57% in Śląskie. However agricultural survivor's pensions were lower than the average salary about 69–75% (table 7).

Table 7. Average monthly social security benefits paid from SII and ASIF according to the provinces in 2008 (in % of average salary)

Tabela 7. Przeciętne miesięczne świadczenia emerytalno-rentowe wypłacane przez ZUS i KRUS według województw w 2008 roku (w % przeciętnego wynagrodzenia[b)])

Details Wyszczególnienie	Old-age pensions Emerytury		Disability pensions in case of inability to work /Renty z tytułu niezdolności do pracy		Survivor's pensions Renty rodzinne	
	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS	SII/ZUS	ASIF/ /KRUS
	in % of average salary/ w % przeciętnego wynagrodzenia					
Dolnośląskie	49.7	24.6	41.2	23.7	44.7	27.7
Kujawsko-pomorskie	46.9	26.0	32.5	23.2	40.1	27.9
Lubelskie	44.8	25.7	33.8	23.3	37.6	26.8
Lubuskie	45.7	23.8	35.2	23.6	39.3	27.5
Łódzkie	46.6	25.5	32.4	22.7	40.2	26.9
Małopolskie	48.3	24.7	37.5	22.5	42.5	25.2
Mazowieckie	51.3	25.9	35.4	22.4	42.4	25.5
Opolskie	47.9	25.1	37.9	23.9	42.0	26.4
Podkarpackie	43.2	24.9	31.2	23.1	37.1	25.6
Podlaskie	44.7	26.1	35.5	22.8	38.0	26.3
Pomorskie	49.6	25.4	38.1	22.7	43.5	26.4
Śląskie	61.5	22.6	49.0	22.9	56.8	25.2
Świętokrzyskie	44.9	25.1	33.0	22.6	38.4	25.8
Warmińsko-mazurskie	45.7	26.1	33.9	23.4	38.6	26.1
Wielkopolskie	48.6	25.3	34.6	22.9	42.0	25.5
Zachodniopomorskie	48.4	25.3	36.6	23.6	41.8	30.8

[a)] The amount of average monthly salary in 2008 was 2943.88 PLN (Przeciętne miesięczne wynagrodzenie w gospodarce narodowej…).

[b)] Przeciętne miesięczne wynagrodzenie w 2008 roku wynosiło 2943,88 zł (Przeciętne miesięczne wynagrodzenie w gospodarce narodowej…).

Source: Own elaboration based on: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Źródło: Opracowanie własne na podstawie: Kwartalna informacja statystyczna 2009, Informacja o świadczeniach pieniężnych... 2009.

Analyzing the share of pension benefits paid by SII, it can be concluded that the level of old-age pensions and survivors' pensions exceed the level of the average monthly per capita available income in employees household in all regions in 2008. The value of employees' old-age pensions was approximately higher by 35% in comparison to the average monthly available income, and in case of survivors' pensions – about 16%. However, the level of disability pensions exceeded the value of 1050 PLN per month only in such provinces as: Dolnośląskie, Małopolskie, Opolskie, Pomorskie, Śląskie and Zachodniopomorskie (Figure 2).

In turn, all pension benefits, paid by ASIF, have not exceeded the average monthly per capita available income in farmers household in many regions in 2008. The value of the all agricultural pensions accounted between 77–87% of the average monthly available income. The exception was observed only in Zachodniopomorskie. In this region, the level of survivor's pensions was higher than 887 PLN (about 2.2%) (Figure 3).

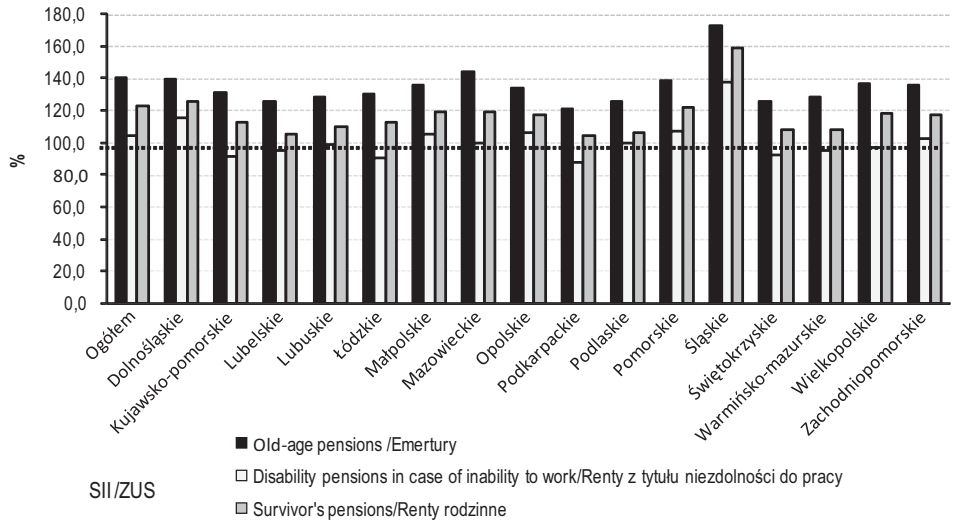

Fig. 2. The structure of social security benefits from SII in average monthly per capita available income in employees household in 2008

Rys. 2. Odsetek świadczeń emerytalno-rentowych wypłacanych przez ZUS w przeciętnym miesięcznym dochodzie rozporządzalnym na 1 osobę w gospodarstwie domowym pracowników w 2008 roku

a) 100% = 1049.84 PLN (the average monthly per capita available income in employees household in 2008)

a) 100% = 1049,84 zł (przeciętny miesięczny dochód rozporządzalny na 1 osobę w gospodarstwie domowym pracowników)

Source: Own elaboration based on: Sytuacja gospodarstw domowych… 2009.

Źródło: Opracowanie własne na podstawie: Sytuacja gospodarstw domowych… 2009.

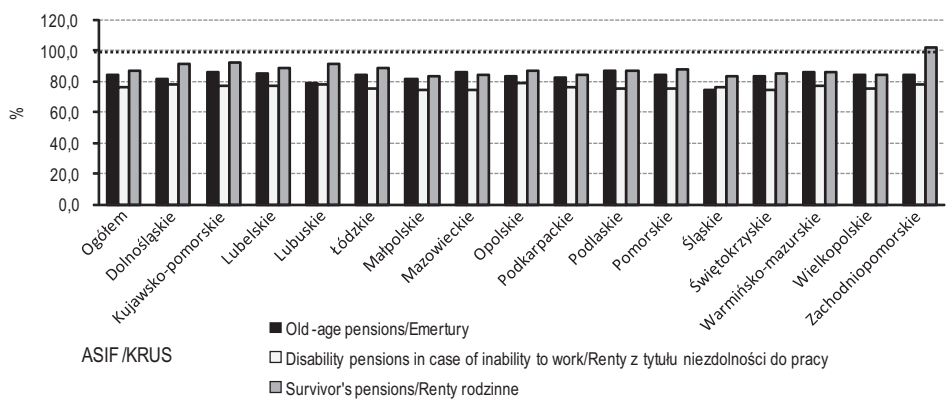

Fig. 3. The structure of social security benefits from ASIF in average monthly per capita available income in farmers household in 2008

Rys. 3. Odsetek świadczeń emerytalno-rentowych wypłacanych przez ZUS w przeciętnym miesięcznym dochodzie rozporządzalnym na 1 osobę w gospodarstwie domowym rolników w 2008 roku

a) 100% = 887.35 PLN (the average monthly per capita available income in farmers household in 2008).

a) 100% = 887,35 zł (przeciętny miesięczny dochód rozporządzalny na 1 osobę w gospodarstwie domowym rolników).

Source: Own elaboration based on: Sytuacja gospodarstw domowych… 2009.

Źródło: Opracowanie własne na podstawie: Sytuacja gospodarstw domowych… 2009.

CONCLUSIONS

The study presents the analysis of the social security benefits level paid from agricultural and employees' social insurance system among regions of Poland in 2008. On the basis of conducted research it was possible to draw the following conclusions:

1. Agricultural pension scheme should be considered as a specific form. This system is directed to a specific socio-professional group and it is complementary to the general system.
2. In the agricultural social security system there is a serious imbalance of the relationship between the insured and the beneficiaries. This situation indicates the need to subsidize the system in the future.
3. The structure of benefits paid by ASIF can be considered as more correct than paid by SII due to the higher share of old-age pensions. However, in the payout structure in ASIF, survivors pensions have little relevance. This does not mean that the agricultural population is to a lesser extent a subject to the risk of income loss due to the death of the breadwinners. This risk occurs at a similar level as in other occupational groups, however, the income protection for this population is provided by the universal social security system.
4. Average monthly pensions paid by ASIF in 2008 was almost a half lower than the employee pension. The share of provinces with the lowest levels of agriculture benefits is much larger than that for the employees insurance system. Therefore the agricultural pensions are paid at the lowest amount in a substantial part of provinces.
5. All pensions paid by ASIF in 2008 were lower than the minimal wage in all provinces, while employees' old-age pensions and majority of survivor's pensions were higher. All pensions, both for employee's and farmer's, were lower than the average wage in provinces.
6. The level of employee's old-age pensions and survivors' pensions exceed the level of the average monthly per capita available income in employees household in all regions in 2008. In turn, all pension benefits, paid by ASIF, have not exceeded the average monthly per capita available income in farmers household in many regions in 2008 (the exception was observed only in Zachodniopomorskie).

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ROZKŁAD ŚWIADCZEŃ EMERYTALNO-RENTOWYCH W UKŁADZIE REGIONALNYM KRAJU – ANALIZA PORÓWNAWCZA

Streszczenie. Celem opracowania było określenie i porównanie poziomu świadczeń emerytalno-rentowych dla rolniczego i pracowniczego systemu ubezpieczeń społecznych w układzie województw w 2008 roku. Materiał badawczy stanowiły dane Kasy Rolniczego Ubezpieczenia Społecznego oraz Zakładu Ubezpieczeń Społecznych oraz źródła ogólnodostępnej statystyki krajowej. W opracowaniu zastosowano podstawowe miary statystyki opisowej. W rolniczym systemie ubezpieczeń społecznych występuje zachwianie relacji między liczbą ubezpieczonych a liczbą świadczeniobiorców. Sytuacja taka wskazuje na konieczność dotowania tego systemu w przyszłości. Rolnicze świadczenia emerytalno-rentowe były wypłacane w najniższej wysokości w znacznej części województw. Przeciętna miesięczna emerytura i renta wypłacana przez KRUS w 2008 roku była prawie o połowę mniejsza niż emerytura pracownicza. Wszystkie świadczenia emerytalno-rentowe, rolnicze i pracownicze były niższe od przeciętnego wynagrodzenia w poszczególnych województwach.

Słowa kluczowe: świadczenia emerytalno-rentowe, Kasa Rolniczego Ubezpieczenia Społecznego, Zakład Ubezpieczeń Społecznych

Accepted for print – Zaakceptowano do druku 27.01.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 21–33*

TYPOLOGY OF TOBACCO-BASED FARMING SYSTEMS AT THE FARM LEVEL IN SOUTH-EASTERN POLAND

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Abstract. The aim of this paper is to analyse the diversity of the farming systems in tobacco farms within south-eastern Poland. The studied 151 tobacco farms are located in three provinces of Poland, i.e. Lubelskie, Podkarpackie and Mazowieckie. 15 diagnostic variables which characterize farming systems were selected for analyses. For multivariate evaluation of farm diversity and their grouping, principal component analysis (PCA) and cluster analysis based on 5 PCs were used. The farms were divided into five clusters which reflected five major types of farming systems in tobacco farms within the studied area. They were distinct mainly for farm size, utilization of the new agricultural know-how and technology, cattle density, fertilization, and also for the contribution of tobacco production to the farm incomes.

Key words: tobacco, farm typology, principal component analysis (PCA), cluster analysis

INTRODUCTION

Tobacco is the most important non-food crop in the world, grown by about 33 million farmers in more than 130 countries, in a wide range of environmental conditions [Warner 2000, FAO 2008, Chavez et al. 2010]. Among the most important producers of tobacco leaves are China, Brazil, India, USA, Turkey and Argentina [FAO 2008, Geist et al. 2009, Chavez et al. 2010]. In Poland, and the world in general, tobacco is grown mainly in rather small family farms [Altman et al. 1996, 1998, Fisher 2000, Geist et al. 2009, Chavez et al. 2010]. In those smallholder farming systems the growing of tobacco is an important fixed element of the farming structure and farm functionality, and ensure socio-economic and ecological sustainability of the systems [Fisher 2000, Warner 2000, Geist et al. 2009, Chavez

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et al. 2010]. Poland is the second largest producer of tobacco leaves in Europe, cultivating primarily light cigarette tobacco. At present, about 60 thousand farmers are involved in the national production of tobacco leaves, which is carried out in about 14 thousand farms, on an area of 17.1 thousand ha. Tobacco is mainly grown in some parts of south-eastern Poland, i.e. the provinces of Lubelskie, Podkarpackie, Mazowieckie and Świętokrzyskie.

The production of tobacco leaves and its profitability are becoming consistently more and more uncertain, both in the world and in Poland. The global and domestic trends with respect to the level and stability of public subsidies for tobacco production are markedly decreasing [Altman et al. 1996, 1998, Fisher 2000, Warner 2000, Chavez et al. 2010]. Under these circumstances, tobacco growers in many countries, including Poland, are at the crossroads [Geist et al. 2009]. This generates a serious threat to the continuity of tobacco production in the country and to sustainable farming, and even to the survival of a number of tobacco farms, especially the less prosperous ones. In some developed countries vigorous attempts are made to create concepts of various forms of interventions by the state, local governments, tobacco companies, and also by central and local agricultural organizations, which can effectively support the tobacco farmers facing the negative effects of external threats for multi-functional and sustainable agriculture [Altman et al. 1996, 1998, Fisher 2000, Warner 2000, Geist et al. 2009, Chavez et al. 2010]. Following the example of other countries, it would be desirable to take similar supporting activities in Poland, too.

One of the most important conditions for ensuring high effectiveness of public interventions in agriculture and rural areas is its flexibility, that is, the creation and implementation of various options of support by the European Union, the state and local governments, suited to diverse (specific) farming systems in the area under consideration [Gibon et al. 1999, Caballero 2001, Dixon et al. 2001, Pardos et al. 2008, Blazy et al. 2009, Roszkowska-Mądra 2010]. This strategy of support interventions requires an assessment of the diversity and identifying types of farming systems (typology of the farming systems) in the respective study areas [Landais 1998, Duvernoy 2000, Köbrich et al. 2003, Blazy et al. 2009, Carmona et al. 2010, Chavez et al. 2010, Zawadka 2010].

The aim of this paper is to analyze the diversity in diagnostic variables that are characteristic of the farming systems (holistic description of agricultural production, non-agricultural activity and resources in farm households) in tobacco farms within south-eastern Poland, and to identify the typology of these systems with multivariate statistical methods, mainly for generating recommendation domains in farming systems research, e.g. to determining innovative structural and developmental adjustments in the identified types of farming systems and also for planning options of supporting these adaptation processes.

MATERIALS AND METHODS

The studied tobacco farms are located in three provinces of south-eastern Poland, i.e. Lubelskie, Podkarpackie and Mazowieckie, although in the last one there are only a few farms of this kind in its south-eastern part (Figure 1). In the last few years, about 50% of tobacco grown in Poland has been produced in the Lubelskie and Podkarpackie provinces.

The size of the population of the tobacco farms covered by the research in the provinces of Lubelskie, Podkarpackie and Mazowieckie in 2009 was 1133. From this popu-

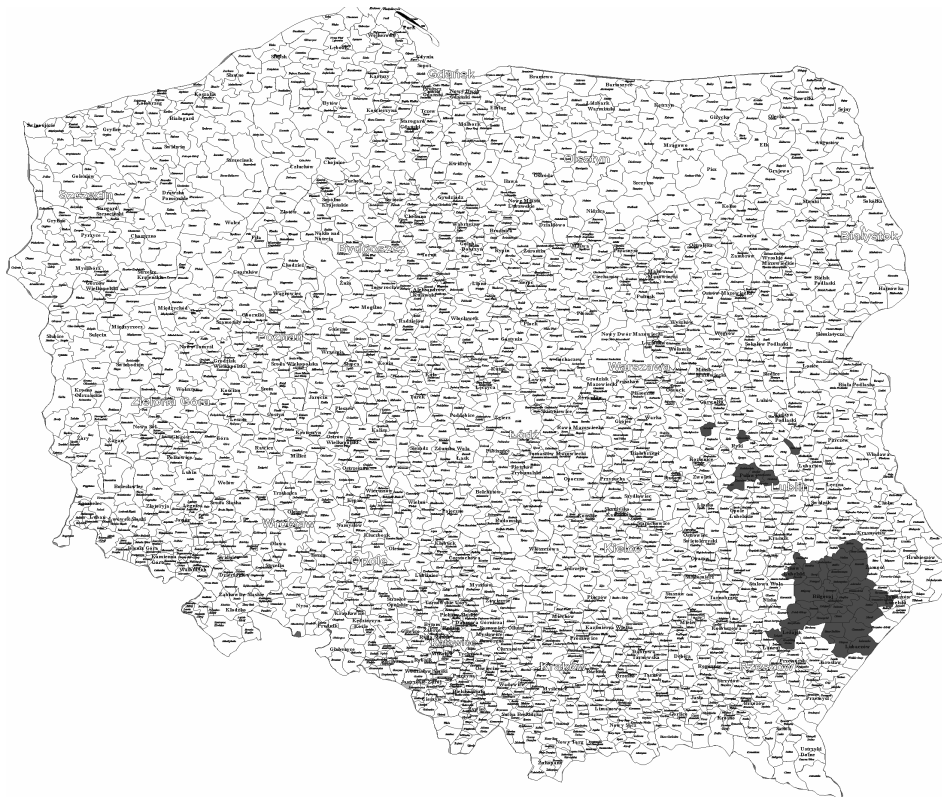

Fig. 1. The area of studying tobacco-based farming systems (the area studied is darker in colour)
Rys. 1. Obszar badań systemów produkcji rolniczej ukierunkowanych na specjalizację produkcji tytoniu (badany obszar jest oznaczony czarnym kolorem)

Source: Author's elaboration.
Źródło: Opracowanie własne.

lation, a random sample of farms was selected using the method of stratified sampling method, in which commune districts formed the strata [Milan et al. 2003, Tittonell et al. 2005, Sang and Birnie 2008, Blazy et al. 2009]. For each commune district, the number of farms to be included in the stratified sample was determined, being proportional to the total number of tobacco farms in that particular district. In order to select farms at random from each district, a computer program was used that randomly generated the numbers for farms located in the district. Among the 151 farms comprising the selected representative sample a survey was carried out by the first author of this paper in the second half of 2009 and at the beginning of 2010.

The survey required the first author of this paper to visit each farm personally and obtain answers to over 40 questions from the head farmer (the farm's manager). The questions related to natural, human and technical resources, production structure, production input and output, and income structure in the farm household. The answers to the ques-

tions were in the form of quantitative as well as categorized variables (nominal or ordinal, expressed on a discrete numerical (i.e. rating) scale. On the basis of the answers obtained in the survey more than 40 diagnostic variables were created.

Diagnostic variables

In order to identify the typology of the studied farms in terms of the farming systems, a relatively small number of key diagnostic variables is chosen, making sure that they are essential in every aspect of the farming systems for the specific purpose of identifying their typology [Kostrowicki 1977, Duvernoy 2000, Köbrich et al. 2003, Iraizoz et al. 2007, Blazy et al. 2009, Chavez et al. 2010, Zawadka 2010]. In addition, these variables should not be strongly correlated; they should, however, show significant variation, such that the coefficient of variation is not lower than 50% [Köbrich et al. 2003, Serrano Martínez et al. 2004a, Thapa and Rasul 2005, Ruiz et al. 2009]. Taking into consideration the aim of this work and the methodological and statistical principles, 15 diagnostic variables were chosen (Table 1).

Table 1. Definitions of the diagnostic variables included in the analysis of the diversity and typology of the farming systems on tobacco farms

Tabela 1. Określenie badanych zmiennych uwzględnianych w analizie zróżnicowania i typologii systemów produkcji w gospodarstwach rolniczych zajmujących się uprawą tytoniu

Variable	Variable designation	Definition of the variable	Units
Natural resources	X1	Soil quality (weighted average soil quality class)	rational number
	X2	Share of grasslands in utilized agricultural area (UAA)	%
Human Resources	X3	Farm owner's level of education [a)]	ordinal scale
	X4	Workers employed in farm agricultural production per 1 ha of UAA	rational number
Technical resources	X5	Number of innovative investments and production improvements made on the farm in the last 5 years	natural number
Structure of production	X6	Farm area	ha
	X7	Share of cereals in arable area (AA)	%
	X8	Share of tobacco in AA	%
	X9	Cattle density	LSU ha^{-1} AA
Production input	X10	Supply of organic fertilizers	ton $ha^{-1}yr^{-1}$
	X11	Supply of NPK fertilizers	kg $ha^{-1}yr^{-1}$
	X12	Agricultural production intensity index [b)]	
Yields	X13	Yield of dried tobacco leaves from 2009 harvest	ton $ha^{-1}yr^{-1}$
Income structure	X14	Contribution of agricultural production to total farm household incomes	%
	X15	Contribution of tobacco production to total farm incomes	%

[a)] 1 – elementary, 2 – vocational secondary, 3 – secondary, 4 – post-secondary, 5 – university

[b)] Agricultural production intensity index calculated on the basis of the normalized variables: cattle and pigs density, supply of NPK fertilizers, share of tobacco in AA (Herzog et al. 2006, Mądry et al. 2010)

Source: Author's elaboration.
Źródło: Opracowanie własne.

Statistical analysis of data

The methodology of the statistical analysis applied here consists of three stages [Köbrich et al. 2003, Serrano Martínez et al. 2004a, b, Blazy et al. 2009, Carmona et al. 2010, Mądry et al. 2010]. In the first stage, a descriptive assessment of the variation in each diagnostic variable was carried out, using univariate statistical parameters.

In the second stage, a Principal Component Analysis (PCA) was performed for all the 15 diagnostic variables chosen. The analysis consists in creating mathematically p uncorrelated linear functions (principal components, PCs) for p original (observed) variables (here diagnostic variables) of the objects under study, each of which explains (captured, account for) the largest possible portion of the objects' variance for all the variables being analysed. A large proportion of the variance can be explained by only a few factors, usually two or three ones. This can occur when the original variables are rather highly correlated. Each PC can be interpreted as a common factor, understood as a substantive source of variation, determining the variables which are correlated with that component as well as being mutually correlated. The PCA was conducted on 15 diagnostic variables after standardization in order to eliminate the effect of a different scale of the variables [Krzanowski 2000, Hair et al. 2006]. In the third stage, a cluster analysis was performed with the Ward's method, using squared Euclidean distance on the first five principle components, for which the eigenvalues were higher than 1 [Krzanowski 2000, Köbrich et al. 2003, Serrano Martínez et al. 2004b, Hair et al. 2006, Chavez et al. 2010]. This method enables us classifying studied farms into homogenous but distinct groups in terms of all the diagnostic variables under consideration. These groups are also homogenous in terms of the farming systems existing in the range of the farms. Then, each of these farm groups identifies a particular type of farming system within the population of the tobacco farms studied.

GENERAL CHARACTERISATION OF FARMS IN TERMS OF INDIVIDUAL DIAGNOSTIC VARIABLES

The estimates of the common statistical parameters for the 15 diagnostic variables (Table 2) indicate that tobacco farms in south-eastern Poland show highly variation for majority of the studied farming system descriptors.

Characteristics and interpretation of the most important principal components

The first Principal Component (PC1): **Intensification and specialization in cattle production**

The first principal component (PC1) accounted for 23% of the total variation in the surveyed sample of tobacco farms (Table 3). This most important principal component was significantly negatively correlated ($|r| > 0.5$) with the number of innovations (X5), farm area (X6), cattle density (X9), organic fertilizer use (X10), NPK fertilizer use (X11) and the production intensity index (X12). PC1 was also significantly positively correlated with contribution of tobacco production to total farm incomes (X15), which was negatively correlated with the important diagnostic variables just mentioned. For that reason, PC1, as factor 1, was called *Intensification and specialization in cattle production*.

Table 2. Statistical parameters for the 15 diagnostic variables of the surveyed tobacco farms
Tabela 2. Parametry statystyczne 15 zmiennych w zbiorze badanych gospodarstw tytoniowych

Variable designation	Variable	Mean	Minimum (Min.)	Maximum (Max.)	Standard deviation (SD)	Coefficient of variation (CV%)
X1	Soil quality	4.09	2.00	5.70	0.76	18.7
X2	Share of grasslands	18.05	0.00	58.00	13.55	75.1
X3	Level of education	2.24	1.00	5.00	0.86	38.5
X4	No. of agricultural workers	0.26	0.05	1.05	0.18	67.5
X5	No. of innovations	0.93	0.00	22.00	2.70	140.1
X6	Farm area	8.62	1.40	37.80	5.14	59.6
X7	Share of cereals	58.50	0.00	92.65	21.14	36.1
X8	Share of tobacco	31.34	3.89	100.00	20.38	65.0
X9	Cattle density	0.25	0.00	2.01	0.31	124.6
X10	Organic fertilizer use	4.21	0.00	30.00	4.26	101.2
X11	NPK fertilizer use	122.11	0.00	402.00	71.61	58.6
X12	Production intensity index	0.22	0.03	0.51	0.09	42.7
X13	Yield of tobacco leaves	2.43	0.90	4.10	0.56	23.2
X14	Contribution of agricultural production to farm household incomes	75.96	20.00	100.00	24.13	31.8
X15	Contribution of tobacco production to farm incomes	82.95	5.00	100.00	16.88	20.3

Source: Author's elaboration.
Źródło: Opracowanie własne.

Many studies on the diversity of farming systems indicate that farm area and the livestock density (mainly of cattle) are among the most important diagnostic variables describing the farming systems and the determinants of their ability to undergo adaptive transformations [Damianos and Skuras 1996, Kristensen 2003, Serrano Martínez et al. 2004a, Paul and Nehring 2005, Iraizoz et al. 2007, Carmona et al. 2010].

The first principal component defines the gradient of the farming systems intensification in tobacco farms within south-eastern Poland; the gradient is positively correlated with the production intensity attributes and negatively correlated with contribution of tobacco production to total farm incomes being diagnostic variables mostly discriminating the farms. It thus appears that large farms with more intensive and diversified, effective agricultural production derive their farm income from growing tobacco to a relatively smaller extent than farms using diametrically different production systems. This also means that incomes and development perspectives of large and intensive farms would be not likely to suffer much if they reduced or abandoned the production of tobacco. On the other hand, reducing or abandonment of growing tobacco in small, extensive farms with a poorly developed agricultural function may be a causal factor of a serious threat to their socio-economic and environmental viability and survival. The threat could be diminished or eliminated if those farms made appropriate adjustment of their farming systems through technical or structural change, agricultural and on-farm non-agricultural diversification, increased product value-added, or engagement with local and regional

Table 3. Correlation coefficients of the first three principal components with the diagnostic variables in the range of the surveyed tobacco farms

Tabela 3. Współczynniki korelacji trzech pierwszych składowych głównych ze zmiennymi diagnostycznymi w zbiorze badanych gospodarstw tytoniowych

Variable designation	Variable	PC1	PC2	PC3
X1	Soil quality	0.10	0.10	–0.28
X2	Share of grasslands	–0.45	0.04	–0.58
X3	Level of education	–0.02	0.01	0.47
X4	No. of agricultural workers	0.29	–0.58	–0.28
X5	No. of innovations	–0.57	–0.04	0.46
X6	Farm area	–0.51	0.39	0.47
X7	Share of cereals	–0.04	0.87	0.02
X8	Share of tobacco	0.14	–0.90	0.10
X9	Cattle density	–0.76	0.00	–0.53
X10	Organic fertilizer use	–0.75	0.03	–0.55
X11	NPK fertilizer use	–0.60	–0.39	0.40
X12	Production intensity index	–0.60	–0.69	0.08
X13	Yield of tobacco leaves	–0.37	–0.09	0.29
X14	Contribution of agricultural production to farm household income	–0.35	–0.21	0.01
X15	Contribution of tobacco production to farm incomes	0.65	–0.34	–0.11
Percentage of the overall variation among farms explained by the principal components		23.0%	19.2%	13.2%

Source: Author's elaboration.
Źródło: Opracowanie własne.

labour markets through pluriactivity [Altman et al. 1996, 1998, Fisher 2000, MacDonald et al. 2000, Warner 2000, Geist et al. 2009, Chavez et al. 2010].

The second Principal Component (PC2): **Farm labour resources and specialization in tobacco production**

The second principal component (PC2) accounted for 19% of the total variation among the tobacco farms surveyed. This principal component was significantly negatively correlated with the number of agricultural workers (X4), share of tobacco (X8) and the production intensity index (X12, but positively correlated with the share of cereals (X7). For that reason, PC2, as factor 2, was called *Farm labour resources and specialization in tobacco production*. The second principal component defines the gradient of labour resources in a farm and their exploitation in tobacco production; the gradient is positively correlated with the number of agricultural workers and the share of tobacco in the arable area, but negatively correlated with the share of cereals in the arable area.

The third Principal Component (PC3): **Grasslands and their utilization in cattle production**

The third principal component (PC3) accounted for 13% of the total variation in the tobacco farms. This principal component was significantly negatively correlated with the

share of grasslands (X2), cattle density (X9) and organic fertilizer use (X10). For that reason, PC3, as factor 3, was called *Grasslands and their utilization in cattle production*. This factor describes the gradient of the grassland area, cattle density and organic fertilization, which is positively correlated with these attributes of the farming system.

Cluster analysis and characterisation of the types of farming systems

The surveyed farms were divided into five clusters (homogeneous groups). The decision as to how to cut the branches of the dendrogram is a compromise between a sensible number of identified groups and intra- and inter-group similarities [Krzanowski 2000, Köbrich et al. 2003, Serrano Martínez et al. 2004b]. The identified homogeneous groups of farms are varied mainly for those diagnostic variables that define the first 3 principal components (i.e. with which they are most strongly correlated), the first principal component representing the strongest correlation. Then, assumed in the paper numbers of the distinguished groups of farms increase as the value of the first principal component (PC1) decreases, indicating an increasing gradient of the intensification and specialization in cattle production (Table 4). The characterisation of each homogeneous group of farms for the major discriminating variables makes it possible to identify and describe comprehensively the distinguished types of farming systems in the surveyed population of tobacco farms [Köbrich et al. 2003, Blazy et al. 2009, Chavez et al. 2010]. On the basis of a detailed analysis of group means for the most important diagnostic variables (Table 4), whose comparative results are presented in Table 5, a multi-dimensional characterisation of five specific types of farming systems found in tobacco farms in south-eastern Poland was made. It is presented as follows:

Type 1 farming system: **A system of extensive crop-oriented, small profitable agricultural production in moderate small, diversified in non-agricultural activity farms with a small share of tobacco in arable areas and low c**ontribution **of agriculture to farm household incomes, mainly tobacco-related.**

Type 2 farming system: **An extensive smallholder not-diversified system with large farm labour resources with a strong tobacco-oriented production and large c**ontribution **of agriculture to farm household incomes, mainly tobacco-related.**

Type 3 farming system: **A system of developing, moderately intensive, diversified crop-cattle production in rather large, slightly diversified in non-agricultural activity, farms with moderately large share of tobacco in arable areas and rather large contribution of agriculture to farm household incomes, mainly tobacco-related.**

Type 4 farming system: **A system of moderately intensive diversified crop-cattle production in large, poorly diversified in non-agricultural activity, farms with moderately large share of tobacco in arable areas and rather large contribution of agriculture to farm household incomes, mainly tobacco-related.**

Type 5 farming system: **A system with low farm labour resources and intensive diversified crop-cattle production in large, not diversified in non-agricultural activity, farms with a small share of tobacco in arable area and a large contribution of agriculture to farm household incomes, mainly not tobacco-related.**

Table 4. Means and standard deviations (SD) of the analysed diagnostic variables and principal components for homogeneous groups (clusters) of the tobacco farms and F-test values for assessing the significance of the differences between the group means

Tabela 4. Wartości średnie i odchylenia standardowe (SD) dla zmiennych diagnostycznych i składowych głównych w wydzielonych grupach jednorodnych gospodarstw tytoniowych oraz wartości dla testu F oceniającego istotność zróżnicowania między średnimi dla tych grup

Group number		1		2		3		4		5		F_{emp} F-ratio	p-value
Number and percentage of farms in a group		40 (26.5%)		13 (8.6%)		57 (37.7%)		28 (18.5%)		13 (8.6%)			
Variable designation	Variable	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
X1	Soil quality	4.19	0.68	3.82	0.79	4.04	0.85	4.36	0.53	3.70	0.80	2.47	0.047
X2	Share of grasslands	13.92	11.76	8.07	10.48	14.25	9.93	32.77	10.41	25.70	15.17	19.60	0.000
X3	Level of education	2.18	0.93	2.15	1.21	2.47	0.85	1.96	0.64	2.08	0.49	2.02	0.094
X4	No. of agricultural workers	0.26	0.16	0.61	0.25	0.21	0.11	0.26	0.12	0.16	0.07	23.05	0.000
X5	No. of innovations	0.55	1.04	1.08	2.50	2.11	1.84	2.18	2.04	5.69	5.79	12.14	0.000
X6	Farm area	6.81	3.33	4.34	2.46	9.68	4.46	7.86	3.78	15.44	8.65	13.26	0.000
X7	Share of cereals	71.18	17.76	25.02	24.87	57.41	15.82	55.78	18.97	63.63	12.75	17.38	0.000
X8	Share of tobacco	18.51	8.41	70.50	27.40	33.44	13.60	33.30	19.12	18.26	10.06	31.99	0.000
X9	Cattle density	0.09	0.11	0.08	0.15	0.13	0.12	0.52	0.19	0.82	0.53	52.49	0.000
X10	Organic fertilizer use	2.28	2.00	1.77	2.17	2.72	1.92	7.46	2.73	12.08	7.32	42.09	0.000
X11	NPK fertilizer use	59.08	37.14	138.46	66.60	140.09	55.56	133.75	62.29	195.85	103.80	18.13	0.000
X12	Production intensity index	0.12	0.05	0.30	0.06	0.23	0.07	0.27	0.08	0.31	0.11	34.42	0.000
X13	Yield of tobacco leaves	2.25	0.59	2.44	0.58	2.53	0.57	2.31	0.39	2.81	0.52	3.49	0.009
X14	Contribution of agricultural production to farm household incomes	61.38	26.19	85.38	24.70	78.68	21.78	80.36	18.95	90.00	17.80	6.49	0.000
X15	Contribution of tobacco production to farm incomes	87.45	13.12	94.62	7.49	83.00	13.50	84.89	11.89	53.00	24.09	18.45	0.000
	PC1	1.56	0.87	1.23	0.70	0.08	0.88	–1.06	0.94	–4.10	1.97	89.73	0.000
	PC2	1.25	0.91	–3.33	1.33	–0.08	1.16	–0.36	1.59	0.60	1.23	36.57	0.000
	PC3	–0.27	0.80	0.18	1.59	0.76	1.02	–1.24	0.75	0.00	2.73	13.15	0.000

Source: Author's elaboration.

Źródło: Opracowanie własne.

Table 5. Characteristics of five types of farming systems in the tobacco farms surveyed
Tabela 5. Charakterystyka pięciu typów produkcji w badanych gospodarstwach prowadzących uprawę tytoniu

Diagnostic variables	Type 1	Type 2	Type 3	Type 4	Type 5
Share of grasslands	**	*	**	*****	****
No. of agricultural workers	***	*****	***	***	*
No. of innovations	*	**	***	***	*****
Farm area	***	*	****	***	*****
Share of cereals	*****	*	***	***	****
Share of tobacco	*	*****	***	***	*
Cattle density	*	*	**	****	*****
Organic fertilizer use	*	*	**	****	*****
NPK fertilizer use	*	***	***	***	*****
Production intensity index	*	*****	***	****	*****
Contribution of agriculture to farm household incomes	*	*****	***	****	*****
Contribution of tobacco production to farm incomes	****	*****	****	****	*

Relative levels of the variables: * very low, ** low, *** moderate high **** high, ***** very high

Source: Author's elaboration.
Źródło: Opracowanie własne.

CONCLUSIONS

1. The tobacco-based farming systems in farms located in south-eastern Poland vary mainly for mutually positively correlated farm size, utilization of the new agricultural know-how and technology, cattle density, fertilization, and also for the contribution of tobacco production in the farm incomes, which is negatively correlated with the mentioned attributes of the production intensity and its non tobacco-related specialization.
2. The tobacco farms surveyed do not vary much for the level of farmers' education, soil quality, yield of tobacco leaves and also contribution of agriculture in farm household incomes.
3. In each of the five types of farming systems with different agricultural production intensity and structure of mainly cereals, tobacco and cattle, and also with different diversification of non-agricultural activities, tobacco is an important or very important source of total farm incomes, irrespective of its different significance in the total farm household incomes.
4. Historically, the identified systems have formed on inherited family farms over a long period of time, mainly in response to environmental conditions, especially the proportion of grasslands, and the processes of adaptation to the demands of the cigarette industry, which emerged more than 50 years ago in the studied area.

5. The typology of the tobacco-based farming systems can be used to: to detect and understand major dimensions (diagnostic variables) of these systems diversity; to identify the most important advantages and disadvantages of the distinguished system types; to identify the recommendation domains, i.e. groups of roughly homogenous farmers with similar circumstances for whom experts can make more or less the same recommending alternative and innovative adaptive adjustments, mainly concerning diversification in crop and livestock production and in non-agricultural activities including also planning of respective options and tools of interventions to support effectively these adaptation processes.

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TYPOLOGIA SYSTEMÓW PRODUKCJI ROLNICZEJ W GOSPODARSTWACH ZAJMUJĄCYCH SIĘ UPRAWĄ TYTONIU W POŁUDNIOWO-WSCHODNIEJ POLSCE

Streszczenie. Celem niniejszej pracy jest analiza zróżnicowania systemów produkcji w gospodarstwach zajmujących się uprawą tytoniu w południowo-wschodniej Polsce. Badania ankietowe wykonano w 151 gospodarstwach, znajdujących się w województwach: lubelskim, podkarpackim i mazowieckim. Wielowymiarową ocenę zróżnicowania gospodarstw i ich grupowanie (typologię) wykonano za pomocą analizy składowych głównych (PCA) i analizy skupień metodą Warda na pięciu pierwszych składowych głównych. Wydzielono 5 jednorodnych grup gospodarstw tytoniowych, odzwierciadlających odpowiednie typy produkcji rolniczej w tych gospodarstwach na badanym obszarze, które były zróżnicowane głównie pod względem powierzchni, wykorzystania nowych technologii produkcji, pogłowia bydła, nawożenia i udziału produkcji tytoniu w dochodach gospodarstw.

Słowa kluczowe: tytoń, typologia gospodarstw, analiza składowych głównych, analiza skupień

Accepted for print – Zaakceptowano do druku 20.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 35–43*

EDUCATION AS AN ELEMENT OF COMPETITIVENESS OF RURAL HOUSEHOLDS IN THE WIELKOPOLSKIE VOIVODSHIP

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Abstract. In the era of globalization and economic integration, education constitutes a significant element of creating the value of human capital. Despite the fact that it is not possible to purchase it, and, only in some degree one may gain it as a result of increased education, it is vital to undertake the activities by governmental and non governmental organizations aiming at its quality improvement. Better educated people better operate on the market and easier adjust to changing market conditions. In rural areas of Wielkopolska only 4.2% of habitants have higher education, therefore it is necessary to undertake complementary activities by institutions dealing with education, solving and promoting different forms of replenishing job qualifications as well as constant education. The graduates should be equipped in capabilities indispensable in market economics, improving their competitiveness.

Key words: education, rural areas inhabitants, human capital

INTRODUCTION

The aim of the elaboration is to define the role of the human capital in building the competitiveness of the households situated in rural areas of Wielkopolskie voivodship. The considerations made in the paper are based on inquiry research conducted by the author in 2004 and 2007 among rural population of Wielkopolskie voivodship, financed from the intercollegiate interdisciplinary project conducted by The Poznan University of Life Sciences and The Poznan University of Economics. The selection of the responders was carried out in such way, so that the sample reflected the socio-economic situation of the entire population. The research results are based on the responders' experience, therefore the results may be burdened by the non-random errors. The sampling had purposive character. In the frames of the conducted analyses the inquiry were carried out adequately

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in 786 and 559 households. The research was carried out in all the 31 districts of Wielkopolskie voivodship. The inquiry questionnaire consisted of 88 questions divided into 11 thematic blocks. The selected questions from the III, V, X and XI block (households incomes, responder's and household's economic activity, education and subjective poverty) were used by the elaboration of the paper. The unpublished data of the Main Statistical Office from 2005 concerning the socio-material situation of rural population had a supplementary character.

The contemporary market economy, setting economic aims as priorities, results in increased competition for foreign investments among communes. The potential investors decide about new locations basing on the possibility of using the synergy effect. The main area of competition are rural areas, which constitute 95% of the area of the Wielkopolskie voivodship and are inhabited by nearly 45% of its overall population. Therefore, they constitute a considerable reservoir of human resources. New challenges of knowledge-based economy impose an improvement in the quality of the capital. Raising the level of education becomes a necessity and, at the same time, increases the chances of development of households and is conducive to an improvement in the situation in the labour market and, consequently, participating in social welfare. As a result, investments in human capital become inevitable in the process of household development and in the development of the society as a whole.

EDUCATION AND THE COMPETITIVENESS OF THE RURAL POPULATION IN WIELKOPOLSKA

Defining human capital is the key element of the considerations on building the competitiveness of households, particularly in rural areas. Its peculiarity derives from the fact that it cannot be materialised as assets acquired on the market, but through self-investments [Marciniak 2002]. Most generally, it can be treated as a total of interrelated variables such as knowledge, skills, experience, creative thinking and the capability of work as well as mobility aimed at finding better employment, health and psychical welfare. These features, though they are not the only determinants, significantly determine the resources of this capital.

The value and the meaning of human capital, also more broadly understood as social capital, result from the fact that it constitutes one of the three dimensions of sustainable development. The participation of the inhabitants of rural areas, i.e. active participation of citizens in managing social issues, is the key factor in the process of expansion [Juroszek 2008, Hauser 1999]. However, in order to be able to talk about unlimited subjectivity of the rural population, it is necessary to meet a number of conditions, including the most important one – constant improvement in the quality of human resources, including the improvement in their education. Therefore, education is treated as investment and one of the elements raising the marginal productivity of human capital. The data from the National General Census shows that the rural population is worse educated than the urban one. The educational gap with regard to university graduates amounts to 9.2 percentage points (there was an increase of 1.9 percentage points between censuses). Although the level of education of the rural population has been on the increase for a long time, over

three quarters of the rural population have no secondary education. While people with secondary and post-comprehensive education constitute the greatest percentage of the urban population, most of the population living in the country have primary education or even lower (Figure 1). This situation results from, among others, greater educational obstacles encountered by the rural environment. A number of families cannot afford to send children to secondary schools, universities or colleges in bigger towns.

The improvement in education in recent years has been caused, among others, by the extinction of the oldest generation, i.e. the worst educated one at the same time and by a lower urban migration balance. It legitimises the claim that the migration of educated people has been limited, but on the other hand, the better educated and those able to find their place on the labour market decide to stay in urban areas, which offer both greater opportunities of getting a satisfactory job and a wider range of future choices. According to Orczyk [2005], the four most important challenges in the coming years include maintaining educational aspirations in society, eliminating significant differences in access to education, developing various forms of educating adults and instant improvement in education quality. Rural youth realise the necessity of further education and making continual improvements to one's skills. The research conducted in 2007 shows that only only one in ten households (9.6%) includes people over 18 not continuing their education on secondary level, which constitutes a decrease by nearly two percentage points. Respondents claim the main reason for discontinuing education to be financial problems (41.3%), and learning difficulties (28.6%). It is also problematic that 27% still believe that the education they have achieved is sufficient and there is no need for them to continue their education (Figure 2). According to a number of opinions, an excess of university graduates can result in a discouragement from one's own self-development, however, the market has not been saturated yet in rural areas and the distance, in comparison with urban citizens, is still quite considerable [Kalinowski, Łuczka-Bakuła 2007].

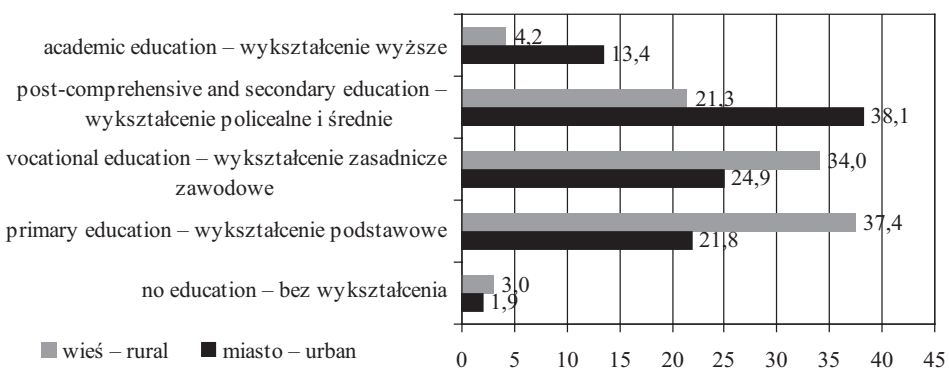

Fig. 1. Education levels among the inhabitants of the Wielkopolskie Voivodship in 2002
Rys. 1. Struktura wykształcenia mieszkańców województwa wielkopolskiego 2002 roku
Source: Author's own calculation based on Gospodarstwa domowe i rodziny. Województwo wielkopolskie, Poznań 2003.
Źródło: Opracowanie własne na podstawie Gospodarstwa domowe i rodziny. Województwo wielkopolskie, Poznań 2003.

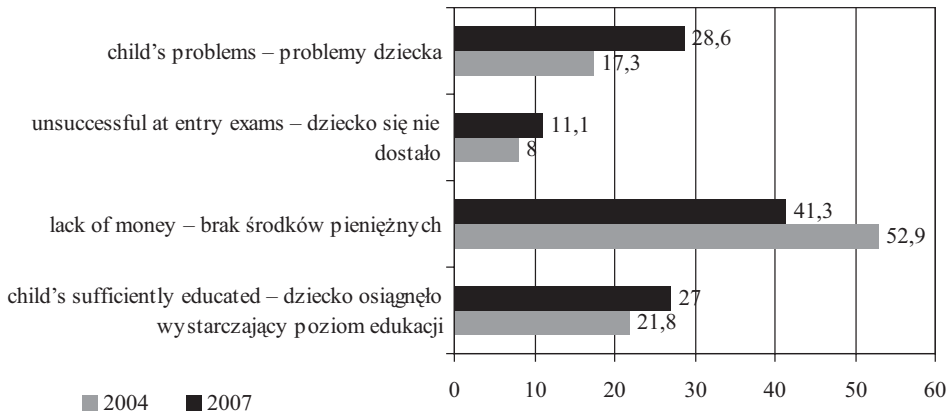

Fig. 2. The causes of abandoning education by the youth
Rys. 2. Przyczyny niekontynuowania nauki przez młodzież
Source: Author's own research – 2004 and 2007.
Źródło: Badania własne.

Relatively low income of people with lower education living in rural areas comparing to the urban population contribute to the so-called phenomenon of brain drain [Michalski 2006], i.e. the migration of better-educated youth, both from rural to urban areas and abroad. Such state of affairs can be a source of trouble for the rural population in following years. The tendency for rural areas to be only inhabited by people with low incomes, as well as the unfavourable way of calculating educational grants and the lack of funds in small schools, can result in a further deprivation of the youth of the opportunity for using extracurricular classes. Research shows that even now, parents are forced to withdraw from private lessons for their children and extracurricular activities. However, it is advantageous that the percentage of households which were unable to bear the burden within the last three years decreased by 5.7 and 2.6 percentage points respectively (Figure 3).

Knowledge has become a good, subject to economic exchange and, therefore, it determines the material status of households. A lower level of education is conducive to earning relatively lower incomes. It results from the unpublished CSO data that the people with academic background earn incomes higher by a third and can manage disposable incomes of 1080 PLN. Secondary school graduates earn not more than PLN 743 (Figure 4). One can therefore assume that lower incomes result from an increased competitiveness in this group and, hence, agreeing for lower earnings for doing any available job. However, as the economic situation improves, these conditions become subject to changes. Even now, one can notice cases of rejecting employment when earnings do not meet expectations. Lack of money and low education level result in a kind of feedbacks. A low level of education is conducive to earning low incomes, which, in turn, limits development opportunities of the youth. Children from rural schools, which rarely implement extended curricula, are usually worse educated than their urban peers. Moreover, they are forced to withdraw from extracurricular activities and choose less prestigious schools with lower demand, which eventually leads to further educational limitations. Therefore, it is advisable to work on creating a complex system of scholarships for the most skilled students, a preferential system of bank loans for poorer families, financed by the state. It is also

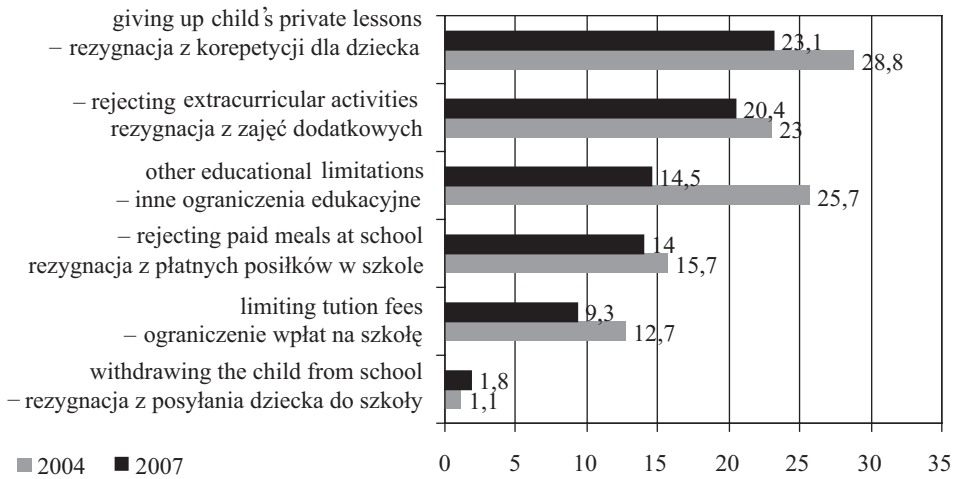

Fig. 3. Educational limitations resulting from financial reasons in 2004 and 2007 (%)
Rys. 3. Ograniczenia edukacyjne z przyczyn finansowych w roku 2004 i 2007 (w %)
Source: Author's own research.
Źródło: Badania własne.

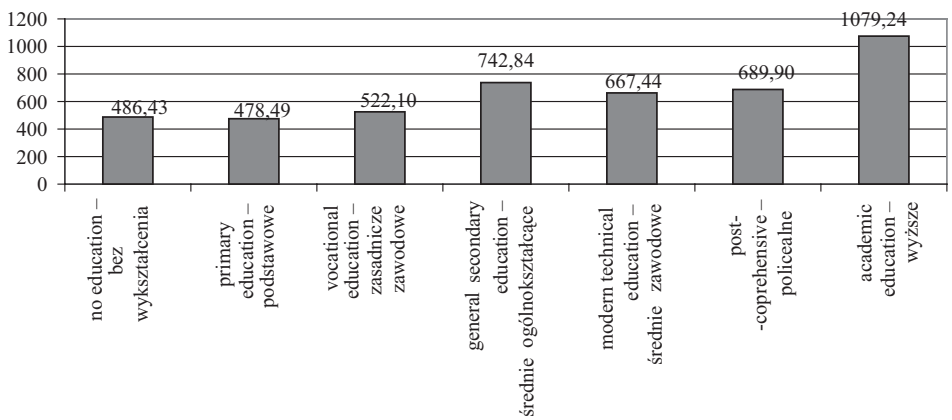

Fig. 4. Disposable incomes depending on the level of education in rural areas of the Wielkopolskie Voivodship (PLN per capita)
Rys. 4. Dochody rozporządzalne w zależności od poziomu wykształcenia w 2005 roku na obszarach wiejskich województwa wielkopolskiego (w zł/osobę)
Source: Author's own calculations based on unpublished CSO data.
Źródło: Obliczenia własne na podstawie niepublikowanych danych GUS.

inevitable to increase budget expenditure on human capital in order to prevent the phenomenon of 'inheriting' the parental professional status and repeating their educational patterns. Due to budgetary limitations, the state is obliged to create instruments enhancing people, including domestic and foreign investors, to invest in human capital.

Less educated rural population have some difficulties with matching the conditions of the local labour market. Besides the fact that they agree to relatively lower wages, they

take up the job incompatible with their aspirations. Simultaneously the fear concerning the incomes loss causes that this group more often decides to work in lower safety standards or threatening health. People without education or of general education three times more often demonstrate the fear concerning the loss their work than the people with higher education (adequately 76%, 73% and 23,4%). They think that in relation to the lack of the adequate skills and realized trainings and courses they may be deprived of the job by employer.

Financial limitations result in a low degree of rural youth's involvement in extracurricular activities aimed to develop their skills. This results in a decline in the development potential of the group. According to Nelson and Phelps [1966], the technical society is obliged to make increasing investments in its own development in order to meet increasing technological expectations as the economy becomes saturated with imported knowledge. However, research shows that two out of five households are forced to reject any extracurricular activities. It is a growing concern that in times of globalisation, only one family in four allocates extra money to studying foreign languages (Figure 5).

The increase of the percentage of people supplementing their education is beneficial for the whole society, as better educated people are able to decide on implementing innovations faster and use new techniques more effectively [Zajączkowska-Jakimiak 2006]. Academic education is conducive to an increased flexibility in the labour market and an easier adjustment to it and also influences the readiness to start work. Research shows that people with academic and post-comprehensive education are more often ready to start work instantly than people with vocational education or those without any education (Figure 6). A low percentage of people ready to start work instantly in all groups can be a symptom of accepting the hitherto situation, but also result from starting unregistered work. Accepting this form of work results mainly from the willingness to be paid a slightly higher salary and to improve one's material situation at the expense of future security.

The level of education correlates with the evaluation of one's own material situation. It also affects the mentality of the respondents and, to a significant degree, determines the perception of reality. The households whose heads of family have academic education evaluate better their own material situation in comparison with other households (Figure

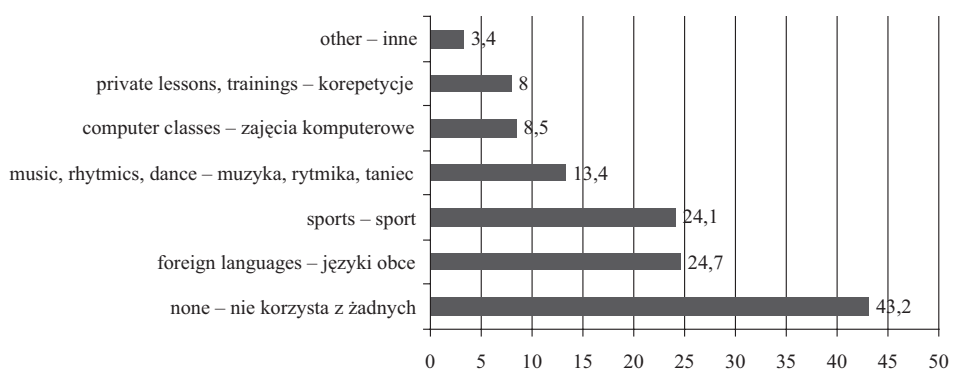

Fig. 5. Using extracurricular classes by rural youth
Rys. 5. Korzystanie z zajęć nadobowiązkowych wśród młodzieży wiejskiej
Source: Author's own research.
Źródło: Badania własne.

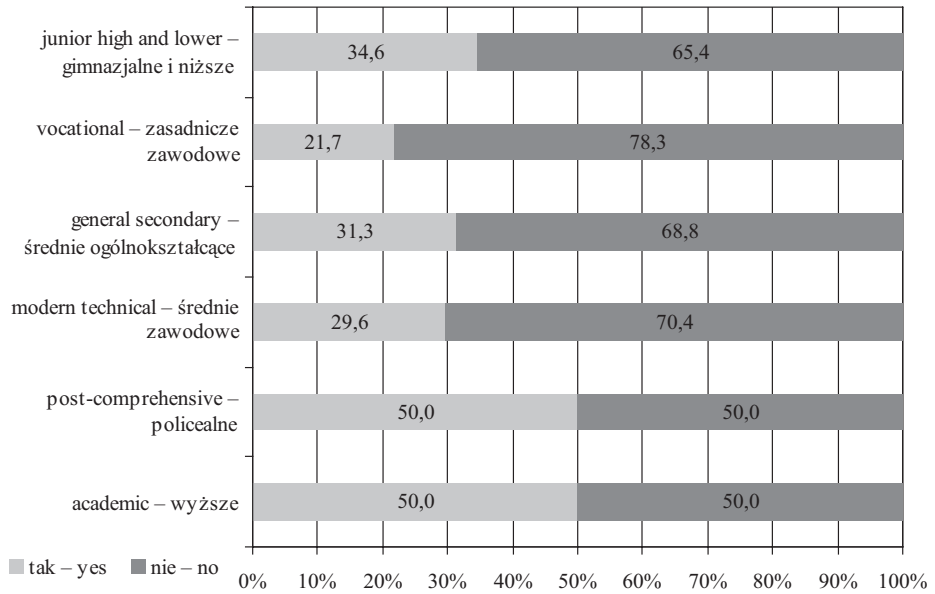

Fig. 6. Readiness to start work (in %)
Rys. 6. Gotowość podjęcia pracy (%)
Source: Author's own research.
Źródło: Badania własne.

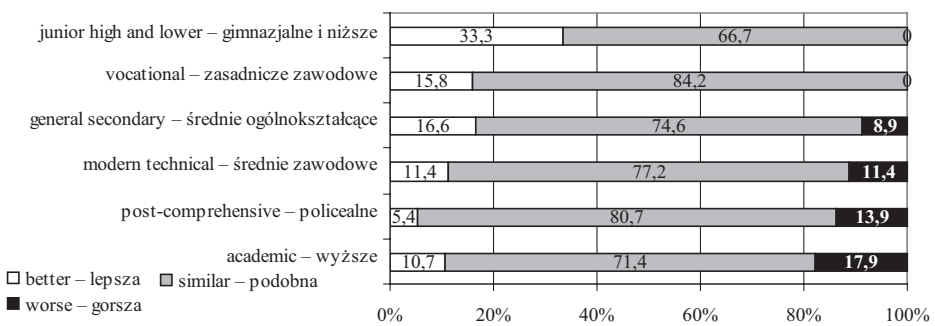

Fig. 7. Self-evaluation of households' material situation in 2007
Rys. 7. Samoocena sytuacji materialnej gospodarstw domowych w 2007 roku
Source: Author's own research.
Źródło: Badania własne.

7). Therefore, it can be assumed that academic education provides greater chances of adaptation to current living conditions and is conducive to a greater satisfaction with one's own financial situation.

People with post-comprehensive and higher education are more willing to take up the risk than the people with lower education. They more often are decided to undertake their own business. Nearly 40% people with higher and 59% of post comprehensive education are willing to start their own business when they lose their job, whereas 28.9% people with

lower education are willing to run their own business (and only 11% people with elementary education). The main reason for resignation of self-employment is lack of adequate funds for launching a business (47.1%), lack of the sense of the point of running own business (36.2%), lack of idea (19.6%) and lack of skills and qualifications (11.9%).

One of the conditions of a proper educational pattern is starting it in the early phase of child's development, i.e. between the ages of three and five. In rural areas of the Wielkopolskie Voivodship, as well as in Poland, pre-school education is of poor quality and it only covers children from the age of six. Only one in ten children in rural areas attends a kindergarten at an earlier age (every third child does in urban areas), which greatly impedes making the opportunities for development equal and contributes to the fossilisation of discrepancies between urban and rural areas. As education is important regarding both, the capital dimension, implemented on the market and, at the same, the personal development, not related with economic opportunities, activities of local governments aimed at increasing the accessibility of education, starting with the kindergarten level, are inevitable. Later on, it is necessary to adjust educating the labour force and adapting it to local labour markets. According to Wieczorek [2001], it should not be forgotten that schools should serve the purpose of increasing households' competitiveness. Hence, graduates should be well equipped with skills inevitable in the market economy, allowing them to compete at the local market.

CONCLUSIONS

Education constitutes a significant element of forming the value of human capital. Although the latter cannot be acquired, but only, to some degree, accumulated as a result of increased education, state activities and the activities of NGOs, aiming at increasing the quality of human capital are inevitable. They may result in an increase of the rate of economic growth and, particularly, an improvement in the social and economic situation of households. It is particularly important due to the relatively low level of education among rural population, as only 4.2% have academic education. As rural youth want, to a large degree, to continue their education, the main obstacle is constituted the lack of sufficient money supplies. The institutions responsible for the improvement in the quality of human capital need to support continual training. Due to the state budget limitations, there is a need for activities and instruments of state policy to encourage investors and other people to invest in human capital. Without proper solutions and instruments, increasing the competitiveness of rural households in the market will not be possible.

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EDUKACJA JAKO ELEMENT KSZTAŁTOWANIA KONKURENCYJNOŚCI WIEJSKICH GOSPODARSTW DOMOWYCH W WOJEWÓDZTWIE WIELKOPOLSKIM

Streszczenie. Kapitał ludzki w dobie globalizacji i integracji gospodarczej jest coraz ważniejszym elementem konkurencyjności gospodarstw domowych. Jego główną determinantą jest wykształcenie, które sprzyja zwiększonej aktywizacji ludności. Osoby lepiej wykształcone lepiej odnajdują się na rynku i łatwiej dostosowują do zmieniających się warunków rynkowych. W związku z tym konieczne są komplementarne i aktywne działania instytucji zajmujących się kształceniem, rozwiązujące i promujące różne formy uzupełniania kwalifikacji zawodowych, a także kształcenia ustawicznego. Absolwenci szkół powinni być wyposażeni w umiejętności niezbędne w gospodarce rynkowej, podnoszące ich konkurencyjność.

Słowa kluczowe: wykształcenie, ludność wiejska, kapitał ludzki

Accepted for print – Zaakceptowano do druku 02.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 45–56*

DIFFERENCES IN POSSIBLE REACTIONS OF EU FARMERS FROM SELECTED EUROPEAN REGIONS TO CAP CHANGE

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Abstract. The aim of this paper is to analyze the likely reaction of farmers to different Common Agricultural Policy scenarios. Farmers' declarations regarding continuation of farming and farm management decision were the key issues examined in the study. The study was conducted in selected regions of several EU countries within the CAP--IRE project[1]. Data has been collected through a farm survey with the use of an interview questionnaire. There were two hypothetical policy scenarios considered: *Baseline*, that assumes the continuation of the present EU agricultural policy, and *Liberalization*, assuming that all forms of public support for the farming sector are withdrawn. The McNerman test was the main tool used for statistical analysis. Research revealed significant differences in reaction of farmers from different regions of the EU countries represented in the study. However, on average, more farmers declared they would rather stopped farming under the no-CAP Liberal scenario and expressed greater interest in off-farm activities than in the Baseline scenario.

Key words: Common Agricultural Policy, policy scenarios, continuation of farming, reaction to changes of the CAP

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[1] The research reported in this paper was funded by the European Commission within the project "Assessing the multiple Impacts of the Common Agricultural Policies (CAP) on Rural Economies" (CAP-IRE), 7th Framework Programme, contract n. 216672 (www.cap-ire.eu). However the paper does not necessarily reflect the views of the EU and in no way anticipates the Commission's future policy in this area.

INTRODUCTION

Since its creation, the Common Agricultural Policy (CAP) has been undergoing significant transformations, adapting its measures and tools to the changing economy and agriculture [Majewski at all 2009]. Till the end of the 1980's, the CAP focused strongly on market interventions and was successful in fulfilling its objectives as set out in the original Treaty of Rome. However, over the years, as a consequence of increasing productivity and technological progress, pushed by price support, significant food surpluses as well as excessive budget expenses to control supplies have been noted [Czyżewski, Stępień 2009]. Due to the situation on the EU markets and external forces (e.g. GATT, later WTO) over the last 25 years the CAP has been systematically reformed. The 2003 reform moved the CAP from production support through area payments to producer support through decoupled income payments in an attempt to make the farmers and the CAP more market oriented [Commission 2010]. CAP reforms have also introduced support not only to productive functions of agriculture but also to other functions creating a basis for sustainable development that takes economic, social and ecological dimensions under consideration. However, previous reforms of the CAP are still considered insufficient, as it was concluded in the last mid-term health-check review [European Commission 2008a, 2008b]. In addition, new challenges are emerging in the policy context, including economic crises, climate change and the growing world food needs. This is leading to proposals for further changes to be introduced in the reformed CAP after 2013. The main challenges for the CAP in next years are formulated as follows [European Commission 2010]:

- „to preserve the food production potential throughout the EU so as to guarantee long-term food security for European citizens";
- „to support farming communities that provide the European citizens with quality and diversity of food produced sustainably, in line with our environmental, water and animal welfare ambitions. The active management of natural resources by farming is a key lever to maintain the rural landscape, to combat biodiversity loss and contributes to mitigating climate change";
- „to maintain viable rural communities, for whom farming is a core economic activity creating local employment''.

New challenges to CAP require introducing adequate operational measures. However, the success of the reforms and future shape of the European Agriculture will be to a large extent determined by the level of farmers' adaptation to changing institutional environment.

Farmers' reactions to expected changes in the future CAP are not fully predictable. Since there still is a number of variants of the post-2013 CAP debated at present, potential responses of farmers can only be investigated with the use of a set of future scenarios. Considerations based on the concept of future policy scenarios are widely used in mathematical models such as partial-equilibrium models CAPRI [Wieck 2003, 2006] or AGMEMOD [Tabeau and van Leewen 2008], as well as in general equilibrium models, such as GTAP. In many cases hypothetical scenarios are the basis for qualitative analyses in which specified groups of stakeholders (e.g. farmers) evaluate future results of presented scenarios [Lobley, Butler 2010, IDEMA 2007]. In the context of CAP reforms, scenarios settings including different degrees of CAP liberalization are often found. For example,

in the study SCENAR 2020 [2007] prepared for the EC, three scenarios were analyzed: "baseline", "regionalization" and "liberalization"). In the CAP-IRE project, A. Cristoiu, F. Sammeth and S. Gomez Paloma [2009] proposed four scenarios differentiated not only by the structure of support but also by the CAP's budget:

1) *Baseline*: the Common Agricultural Policy is continued unchanged after 2013 compared to the previous programming period (2007–2013).
2) *Liberalization*: all forms of public farm support (CAP and national funding) are discontinued.
3) *Environment*: in 2020 two thirds of the CAP budget is assumed to be allocated to Pillar 2 (rural development).
4) *Regionalization*: in 2020 two thirds of the CAP budget is assumed to be allocated to Pillar 1 (Market and Income support).

Baseline and Liberalization (No CAP) represent the two extreme situations and seem to be very useful for analyzing farmers' reactions to strongly contrasting general directions of policy reforms (existing or completely withdrawn support). These two scenarios were the basis for the analysis presented in this paper.

Evaluation of differences in possible farmer's reaction to two of the scenarios considered in the project (Baseline and Liberalization) in the perspective of the year 2020 in several European regions was the main aim of the paper.

RESEARCH METHODS

The study is based on data collected in the farm survey conducted within the CAP--IRE project. A standardized questionnaire containing questions about possible farmer's reactions in two hypothetical scenarios was used for the survey. In the first scenario, named *Baseline*, it was assumed that the Common Agricultural Policy is continued unchanged after 2013 (compared to the previous financial framework for 2007–2013). The second scenario (*No CAP*) assumes complete liberalization, what would mean that all forms of public support (CAP and national funding) for the farming sector are removed. Both scenarios are unlikely to happen, but reference to extremes seems to be useful in assessing possible farmer's responses to the new CAP.

Farmers interviewed in the survey could choose from three main categories of answers in relation to those question that dealt with farm growth and investment plans: "an increase", "no change" or "decrease". They also had the possibility not to answer a question at all or to say "I don't know". Taking into account rather assertive meaning behind the answer ,,increase" and often uncertain interpretation of the difference among the other potential answers from a sustainability and farms growth perspective, authors have decided to simplify the analysis of answers to a dichotomous form. This resulted in the formation of two categories of farmers for each question: those who are declaring "an increase" and those who are not declaring "an increase". Such construction of the research enabled the use of statistical tests for two-ways arrays. The farmers answering in Baseline Scenario and in No CAP Scenario were considered as two dependent (from a statistical point of view) groups. This allowed to apply the McNemar test in order to compare statistical significance of differences between the

scenarios. The test is a non-parametric method applied to nominal data and allows to examine the significance of changes that might be influenced by specific factors. In the research, the factor was the hypothetical change of the CAP from Baseline to No CAP Scenario. More specifically, the test examined whether the change of the CAP scenario had a significant influence on the number of farmers declaring "an increase" in specific questions. For each question the results from the survey were presented in 2x2 contingency tables according to the scheme below (Table 1). The mark "+" was used to describe positive answers (e.g. continuation of farming, an increase of scale production, an increase of UAA etc.), whereas "–" to describe other categories of answers. The letter "B" in the table symbolizes the number of farmers who changed their answer from positive to negative in reaction to presented CAP Scenario from Baseline to No CAP and the letter "C" symbolizes those respondents who have switched from negative to positive answer in reaction to the change of the CAP scenario. Letters "A" and "D" indicate persons who have chosen the same category of answer in both scenarios. The null hypotheses stated that in reaction to changing CAP Scenario there was no significant change in frequency of farmers pointing out positive answers "+" in comparison to alternative hypotheses stating that the frequencies were changed. No evidence to reject null hypothesis would mean that there is no significant influence of the presented CAP Scenario on future farmers' decisions in specific issues. To verify the null hypothesis, the following statistics was used:

$$\chi^2 \frac{(|B-C|-1)^2}{B+C}$$

Under the null hypothesis, χ^2 statistics has a chi-squared distribution with 1 degree of freedom. If calculated value Ch^2 (χ^2) is larger than Ch^2 under assumed alpha = 0.01, the null hypothesis should be rejected; this can be interpreted as a significant influence of CAP Scenario on farmers declarations about their future decision.

Differences between responses of farmers from 11 European regions were compared between each other with the use of graphic method. Significance of differences in replies between Baseline and No CAP Scenario was confirmed then with an application of statistical tests.

Table 1. Scheme of McNemar test
Tabela 1. Schemat testu Mc Nemara

		No CAP Scenario (after changes)		Sum
		„+"	„–''	
Baseline Scenario (before changes)	„+"	A	B	A+B
	„–„	C	D	C+D
Sum		A+C	B+D	N

Source: Authors' scheme.
Źródło: Opracowanie własne.

RESULTS

There were 2363 farmers from 11 regions located in 9 countries of the European Union interviewed in the survey. Selected information on farms' characteristics is presented in Table 2. The average size of a farm in the sample was almost 100 ha[2], however averages in different regions varied significantly. The smallest farms were observed in Macedonia and Thrace (Greece) and only slightly larger are the farms in Podlaskie (Poland) and Emilia-Romagna (Italy). The largest average UAA was noted in North East of Scotland and Ostprignitz-Ruppin/North-East Brandenburg (Germany). The surveyed group was also significantly differentiated from the farms' specialization point of view. However, the distribution of the three main types of production (crop, livestock and mixed farms) turned out to be similar (about 1/3 of farms falls into each specialization). In most of the regions the interviewees categorized their farms slightly more frequently as specialized in crops or mixed. The share of farms specialized in livestock was the highest in the samples from Podlaskie (Poland) and Noord-Holland (Netherlands) regions. Noticeable differences between the regions can be also found as regards the importance of revenues from farming in contributing to the total household 's income (Table 2). Households with dominating agricultural income were observed mainly in Macedonia and Thrace Region (Greece) (80% of farms with share of agricultural income more than 70%) as well as in Podlaskie, Noord-Holland (Netherlands) and North East of Scotland (UK) regions (which percent of farms with share of agricultural income higher than 70% is respectively 65%, 60% and 59%). On the opposite in the Lahn-Dill-District (Germany) region more than 80% of interviewed farmers declared a share of agricultural income on the level below 30%. On the average in the survey only slightly above 50% of households achieved more than 70% of incomes from farming. Rather small share of households with non-farming activities (about 20% in whole sample) suggests that the sources of non-agricultural income must be off farm jobs or different forms of social support. A noticeable difference in demographic characteristics of farmers between regions has been observed in the survey. The mean age of farmers was about 49 years, but farmers in Emilia-Romagna (Italy) were, on average, 10 years older whilst in Podlaskie 10 years younger than the sample average. Interviewed farmers from all regions are well educated. On average more than 65% of farmers reported a high (secondary) school education, but again education level varies significantly between regions. When taking into account the share of respondents participating in farmers' organizations a similar differentiation is observed. On average a half of interviewed farmers were members of such organizations. The range of participation varied, however, from nearly 10% in the Podlaskie region to almost 90% in Emilia-Romagna (Italy).

Examining possible reactions of farmers to likely CAP reforms was the key issue in the survey. The most general question was about the future continuation of farming activities. The percentage of farmers declaring the continuation of farming until 2020 is presented in Figure 1. On average, assuming the present shape of CAP in the Baseline scenario, about 75% of interviewees declared continuation, while under No CAP Scenario such declaration was made by 45% of the farmers. A negative answer (discontinu-

[2] Total land = owned land + rent in – rent out.

Table 2. General characteristics of sampled farms
Tabela 2. Ogólna charakterystyka badanej zbiorowości gospodarstw

Specification		region/country											
		1. Podlaskie (Poland)	2. Noord-Holland (Netherlands)	3. Macedonia and Thrace (Greece)	4. Emilia-Romagna (Italy)	5. North East of Scotland (UK)	6. Andalusia (Spain)	7. South-East Planning Region (Bulgaria)	8. Centre (France)	9. Midi-Pyrénées (France)	10. Lahn-Dill-District (Germany)	11/1 Ostprignitz-Ruppin /North--East Brandenburg (Germany)	Ogółem
		PL	NL	GR	IT	UK	ES	BG	FR1	FR2	DE1	DE2	Total
Number of farms		249	300	300	300	168	201	273	140	155	117	160	2363
Average UAA		25.0	45.4	16.0	25.1	234.1	99.4	143.6	178.5	128.9	41.6	316.1	97.8
% of farms by specialisation	crops	0.8	8.7	33.3	83.9	10.8	86.6	44.7	47.1	19.3	13.7	25	35,7
	animals	57.8	68	3	8.6	13.7	2.5	32.2	20	36.9	35	21.3	28
	mixed	41.3	23.4	63.7	7.3	75.7	11	23	32.8	43.8	51.2	53.8	36,3
% of households with non-farm income on level	< 30%	3	17	1	47	13	41	7	14	14	81	39	22
	> 70%	65	60	80	32	59	39	54	49	48	6	33	52
% of farms with non-agricultural activity		10	45.3	12	9	36.9	3	13.7	24.3	21.9	10.7	35.7	19.8
Farmer's age		35	51	49	59	55	54	47	36	44	50	52	49
% of responders with at least high school education		85	75	22	36	92	44	92	79	61	71	95	66
% of farmers participating in farmer's organizations		8	78	53	89	52	55	23	72	63	46	44	54

Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

ing farming) was given in only 15.4% of cases in Baseline Scenario and 40% in No CAP Scenario. Other respondents refused to give unequivocal declarations choosing option "don't know".

The share of farmers declaring the continuation of farming varies in regions included in the survey. The largest number of farmers going to continue has been observed in the Podlaskie region (in both scenarios). The lowest number of such farmers has been found

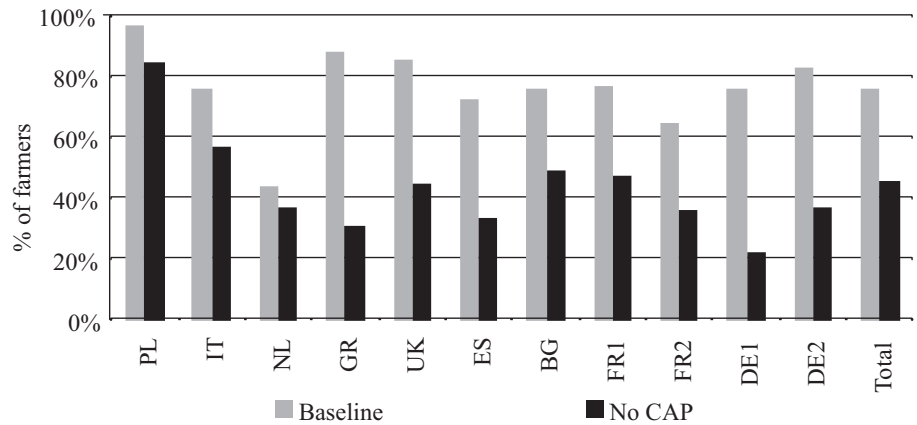

Fig. 1. Percentage of farmers declaring continuation of farming
Rys. 1. Odsetek rolników deklarujących kontynuację prowadzenia gospodarstwa
Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

in Noord-Holland (Netherlands) in the Baseline Scenario and in Lahn-Dill-District (Germany) in the No CAP Scenario.

Statistical analysis for the entire sample of farms with the use of the McNerman test points out that differences between answers observed in the Baseline and No CAP scenarios are statistically significant on the assumed level $\alpha = 0.01$ (Table 3).

The results of the test indicate that policy scenarios significantly influence potential decision on continuation of farming. Only in Noord-Holland (Netherlands) the empirical value of the McNerman test is almost equal to the critical value. Although it might be still considered as statistically significant difference, practically it suggests, that other factors than CAP scenarios may strongly influence decisions about the continuation of farming. In the Noord-Holland province such factor is lack of successor in the family, what comes out of the analysis of reasons for discontinuing farming that are presented in Table 4.

Lack of successor that was the main reason for discontinuation in Noord-Holland, can be ranked as second important factor in the whole sample – on average this answer was selected by 19% of farmers who declared they would stop farming in No-CAP scenario. Expectation of low probability was the key factor for 61% of farmers in the sample.

Farmers' declarations about future changes in farm area were differentiated depending on the CAP scenario (Figure 2). On average the percentage of responders planning to increase area in Baseline scenario was markedly higher than in No-CAP, with some exceptions (Noord-Holland, Macedonia and Thrace and Midi-Pyrénées). In the most of the regions proportion of farmers declaring an intention to increase farm area under one of the presented scenarios were almost equal. In 3 regions only [Podlaskie (Poland), South-East Planning Region (Bulgaria) and Ostprignitz-Ruppin /North-East Brandenburg (Germany)] the differences were statistically significant (Table 3), what is coherent with the Figure 2.

Table 3. Chi2 values and the significance of differences for specified questions by regions
Tabela 3. Wartości Chi2 i statystyczna istotność odpowiedzi na pytania według regionów

Region	Variable				
	Continuation of farming	Increase of area	increase of non-agricultural activity scale	Increase of intensity production	Increse of credit use
IT	26.03	3.125000	0.000000	.8000000	13.13636
	p =.00000	p =.07710	p = 1.0000	p =.37110	p =.00029
NL	6.72	.0454545	17.32331	12.50000	8.653846
	p =.00952	p =.83117	p =.00003	p =.00041	p =.00326
GR	162.00	4.166667	1.617977	a)	a)
	p =0.0000	p =.04123	p =.20338	a)	a)
PL	26.03	22.04167	191.0052	63.01538	94.72321
	p =.00000	p =.00000	p = 0.0000	p =.00000	p = 0.0000
UK	20.04	0.000000	30.86735	0.000000	3.375000
	p =.00001	p =1.0000	p =.00000	p =1.0000	p =.06620
ES	66.01	.1666667	44.48529	4.166667	1.125000
	p =.00000	p =.68309	p =.00000	p =.04123	p =.28885
BG	49.01	28.03333	13.01786	20.48485	17.42222
	p =.00000	p =.00000	p =.00031	p =.00001	p =.00003
FR1	27.03	.6428571	13.02083	4.166667	.6428571
	p =.00000	p =.42268	p =.00031	p =.04123	p =.42268
FR2	22.04	0.000000	18.15000	.2500000	2.083333
	p =.00000	p =1.0000	p =.00002	p =.61708	p =.14892
DE1	51.01	2.250000	8.521739	a)	a)
	p =.00000	p =.13362	p =.00351	a)	a)
DE2	67.01	11.3	1.884615	.2500000	.4444444
	p =.00000	p =.00080	p =.16981	p =.61708	p =.50499

a) statisics not calculated because there no differences in answers to specific questions

Source: Authors' calculation.
Źródło: Opracowanie własne.

Table 4. Reasons for discontinuing farming stated by farmers in No CAP Scenario
Tabela 4. Powody deklarowanego zaprzestania prowadzenia gospodarstwa w scenariuszu liberalnym

Reasons	PL	NL	GR	IT	UK	ES	BG	FR1	FR2	DE1	DE2	Total
	% of farmers declaring discontinuing											
Not profitable enough	84	23	75	56	71	85	52	35	43	73	68	61
Too many constraints (or obstacles)	5	4	8	–	–	–	9	2	2	6	1	4
High risk of farming	–	3	9	5	3	1	26	13	13	1	6	8
No succession within family	11	65	7	16	14	13	4	13	29	12	18	19
Other	–	3	–	21	11	1	1	7	5	4	1	4
Do not know	–	2	2	2	–	–	8	30	9	4	6	4
Total	100	100	100	100	100	100	100	100	100	100	100	100

Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

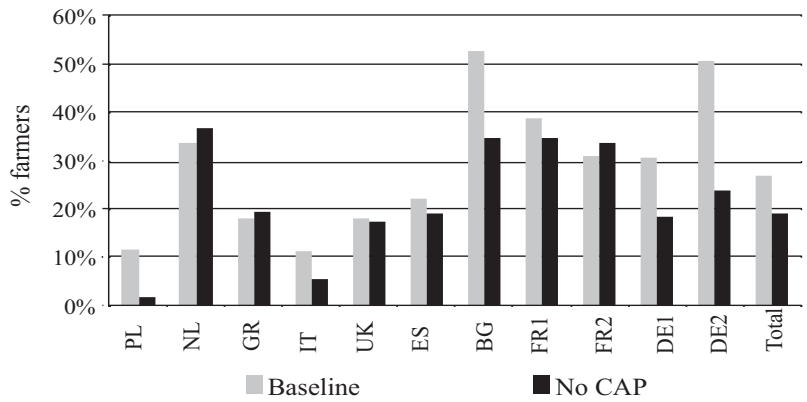

Fig. 2. Percentage of farmers declaring „increase" of own farm area
Rys. 2. Odsetek rolników deklarujących zwiększenie powierzchni gospodarstwa
Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

The analysis of responses to the question whether farmers would "increase" input of fertilizers and pesticides (Figure 3) shows, that in majority of the regions only a few percent of interviewees declared they would intensify production. On the opposite, the most of farmers from South-East Planning Region (Bulgaria) and Podlaskie (Poland) would intensify production under the Baseline scenario, and only farmers from the Bulgarian case study area would react so also in the No-CAP scenario. Very likely in both regions farmers reasoning results from a relatively lower intensity of production in new members states. Podlaskie farmers clearly link their declaration on the intensity of production with a CAP support.

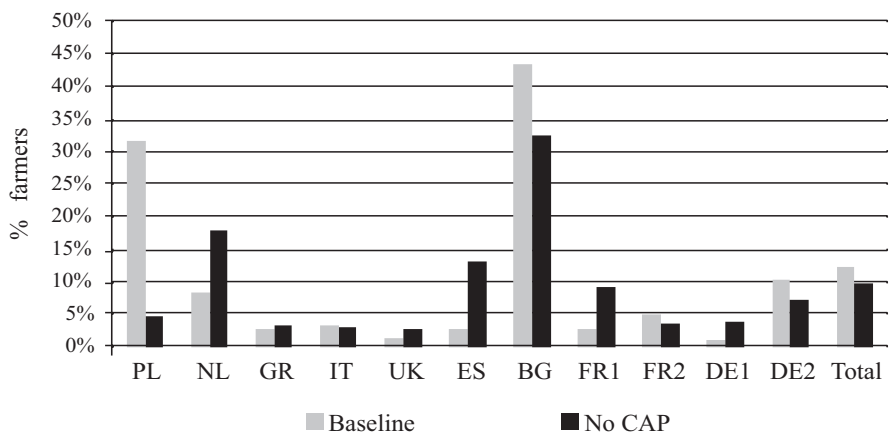

Fig. 3. Percentage of farmers declared „an increase" of intensity production
Rys. 3. Odsetek rolników deklarujących podniesienie intensywności produkcji
Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

In most cases of the regions the differences between answers in Baseline and No CAP scenario were not statistically significant (at the $\alpha = 0.01$ level) with the exception of of Noord-Holland (Netherlands), Podlaskie (Poland) and South-East Planning Region (Bulgaria). Assuming a less restricted $\alpha = 0.05$ significant differences could be observed in Andalusia (Spain) and Centre (France) as well.

A strong variation of answers between scenarios was also found as regards the issue of non-farm activities (Figure 4). In the most of the regions declarations about "increase of scale of non-farming activity" was more frequent in case of the CAP abandonment scenario. It suggest that farmers under pressure of worse economic situation would be more willing to search for non agricultural sources of household income, what seems to be especially important in the context of new challenges for agricultural policy like multifunctional development of rural areas or diversification of farmers' incomes. However, again farmers reaction to this question was not univocal in all the regions. Very different way of thinking characterized farmers from Emilia Romagna and Podlaskie who expressed less interest in non farm activities. Attitude of Podlaskie farmers is in line with their determination to continue farming under both policy scenarios (Figure 1) and can be easily explained – Podlaskie is a typical agricultural, relatively low populated region of the country and farmers don't foresee any real opportunities for non-farm activities.

Both in Podlaskie region and in the majority of others, the differences between scenarios were statistically significant.

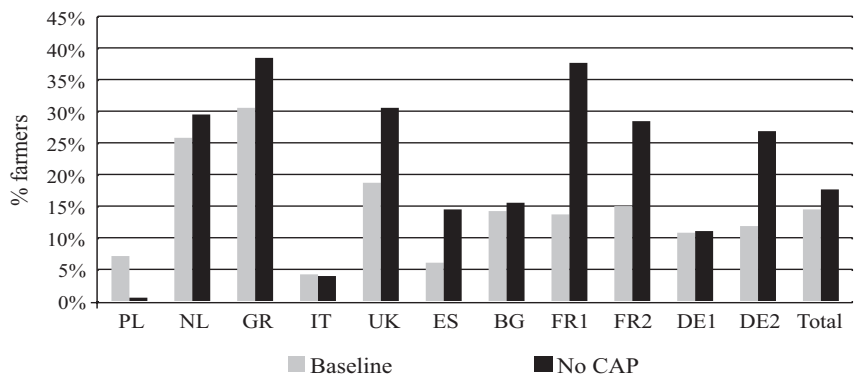

Fig. 4. Percent of farmers declaring „ an increase" of non-farm activity scale
Rys. 4. Odsetek rolników deklarujących podjęcie lub zwiększenie rozmiarów działalności pozarolniczych
Source: CAP-IRE Deliverable no. D2.13-23, 2010.
Źródło: Opracowanie projektu CAP-IRE D2.13-23, 2010.

CONCLUSIONS

In this paper we carried out an analysis of the effects of different CAP scenarios based on stated intentions collected through a survey of farm-households. The research revealed significant differences between regions of the EU countries represented in the study. Differences concern not only natural conditions for agricultural production, scale and intensity of agricultural activities and level of farms' modernity but also possible

farmers' reactions to changes of the Common Agricultural Policy. These differences in reactions may result from different local conditions and historical experiences of farmers from the "new" and "old" members of the EU, as well as from current financial situation and different farmers' expectations regarding the future. It indicates the crucial challenge for the CAP which is to maintain a Common policy framework while fitting to a variety of regional conditions and expectations of policy beneficiaries.

However, the limited statistical significance between number of farmers declaring, "an increase" for specified structural parameters questions in Baseline and No CAP Scenario in many regions suggests that the design of the CAP, or even the CAP as a whole, is not the only and exclusive factor determining future farmers decisions. An important issue for further research is then to analyze farmers' answers in connection to their regional context, in order to elicit further factors that can affect future changes in farming sector.

The results also lead to the conclusion that the strongest connections between CAP Scenarios and the kind of answers were usually noted among farmers from Podlaskie (Poland) and from South-East Planning Region (Bulgaria). It suggests that farmers from these regions usually assume farms development (increase) only in case of receiving support from CAP or, in general, are more dependent on the policy than it is the case in other regions. This may strengthen the existing policy concern about a re-alignment of the CAP design between Old and New Member States, though it does not provide a clear answer about the most suitable direction to be taken in such re-alignment process.

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ZRÓŻNICOWANIE MOŻLIWYCH REAKCJI ROLNIKÓW Z WYBRANYCH REGIONÓW UE NA ZMIANY WPR

Streszczenie. Celem opracowania jest przedstawienie wyników analizy możliwych reakcji rolników na różne scenariusze wspólnej polityki rolnej. Deklaracje rolników dotyczące kontynuacji prowadzenia gospodarstwa i decyzji co do zmian w poziomie intensywności produkcji były zasadniczym przedmiotem badań. Badania przeprowadzono w wybranych regionach z kilku krajów UE w ramach projektu CAP-IRE. Dane zgromadzoną drogą wywiadu z rolnikami z wykorzystaniem kwestionariusza wywiadu. Uwzględniono dwa hipotetyczne scenariusze polityki rolnej: *Baseline*, w którym założono kontynuację obecnej WPR, oraz *Liberalny*, w którym przyjęto wycofanie wszelkich form subsydiowania sektora rolnictwa. Test McNermana był głównym narzędziem statystycznym zastosowanym w analizie. Badania wykazały znaczące zróżnicowanie reakcji rolników w regionach UE reprezentowanych w projekcie. Przeciętnie, w całej zbiorowości przeważali rolnicy deklarujący zaprzestanie prowadzenia gospodarstw i wykazujący wieksze zainteresowanie działalnościami pozarolniczymi w warunkach scenariusza liberalnego, w porównaniu do scenariusza Baseline.

Słowa kluczowe: wspólna polityka rolna, scenariusze WPR, kontynuacja gospodarowania, reakcja na zmiany WPR

Accepted for print – Zaakceptowano do druku 17.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 57–68*

ECONOMIC POLICY IN CENTRAL EASTERN EUROPE: UNIT ROOT CONSEQUENCES

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Abstract. This article aims to provide an econometric justification for economic policy in the Central and Eastern European area by examining the stability of real GDP and industrial production in the Czech Republic, Slovakia, Poland, and Hungary. Stability of GDP and industrial production is examined by unit root tests. The Dickey-Fuller (1979) unit root test indicates unit root in case of all four outputs. In case of the industrial production, the results are mixed. Nonetheless, difference stationarity of the GDP implies that there is no deterministic time trend in GDP. Therefore, there is no short-run trend reversion. Deep and long recessions are not only possible but also even likely. Thus, actions of economic policy can be regarded as justified because they are desirable to boost economy in order to reverse these recessions. This study can also be regarded as an extension of unit root tests to the post communist countries.

Key words: Central Eastern Europe, Classical Economics, Keynesianism, Stability of output, Unit root

INTRODUCTION

The end of the Second World War in 1945 marked the beginning of more than forty years during which the European continent was divided by the 'Iron Curtain' and the two parts progressed along different paths. Politically, economically, socially, and culturally, there seemed to be little to unite the divided Europe. However, in one area at least there appeared to be a common development, namely the emergence of the state as the major economic decision-maker in society. In Central Europe, the role of the state was determined by socialist principles. Socialism required the state to own the means of production and this would enable the authorities to develop the system of central planning. Within a few years of the emergence of Soviet hegemony, the socialist states had appropriated the means of production. There were some exceptions such as the development of Polish agriculture outside the collectives and limited private enterprise was tolerated in Hungary after the 1960s.

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In the West, the state interventionism developed in reaction to the largely unsatisfactory socio-economic conditions of inter-war years. For instance, significant parts of the French economy were nationalized and this policy assisted the creation of the system of indicative planning utilized by the authorities. In Scandinavia, high levels of taxation became the norm as the state developed the social welfare model designed to promote social cohesion. In the United Kingdom, similar trends can be identified with the creation of universal national insurance and the National Health Service. However, the role of the state in Western Europe was conditioned also by the belief in Keynesian macroeconomics. J.M. Keynes had observed that the inter-war economy seemed mired in permanent recession with little evidence of the classical optimism of an essentially self-regulating economy. The belief in Say's Law meant that output is only limited by supply constraints and that any disparity between the supply and demand for labour would be closed by the invisible hand of the market or more precisely by a change in real wages. Persistent unemployment was explained by the emergence of trade unions restricting wage cuts. In contrast, the General Theory [1936] demonstrated that an unregulated market economy was unlikely to grow with a continuously high level of unemployment. Governments would have to intervene actively to promote full employment by forcing down interest rates to stimulate investment which was subject to expectations regarding future profits and the supply price of capital assets and thus subject to volatility. Additionally, there was a role for increases in public spending since Keynes rejected Say's Law in favour of the principle that output is demand constrained. Effective demand determines the trend of output and employment. In particular, the volatility of investment expenditure reflected the state of expectations and could create a level of demand in the economy, which leads to unemployment. The role of expectations together with a liquidity trap, which would set a floor for interest rates, could create the conditions for a persistent downturn with no guarantee that the trend rate of expansion in the economy would be resumed. Thus, a reformed or regulated capitalist system was desirable.

"For my part I think that capitalism, wisely managed, can probably be made more efficient for attaining economic ends than any alternative system yet in sight, but that in itself it is in many ways extremely objectionable" [Keynes 1926, p. 47–58].

Keynesian principles were adopted after 1945 albeit in a manner that bore limited resemblance to the analysis offered by the 'General Theory'. "Government after government accepted that it was not just the duty of government to maintain a high level of employment, it was also within its powers" [Corry 1983]. Governments took responsibility for demand – management, which was defined as a: "purposeful management of the overall level of demand in the economy to achieve macroeconomic aims such as full employment, growth, or avoidance of inflation" [Allsopp 1985].

The tendency of an economy to move ahead in a cyclical pattern with the associated problems of boom and slump could be avoided by the manipulation of demand by timely discretionary policy. This viewpoint was reinforced by the development of the Phillips Curve, which predicted a stable trade-off between unemployment and inflation. The authorities could chose between stable outcomes for these variables and divergences from the optimum could be corrected by appropriate expenditure changing policies. The approach assumes that the workings of the economy were sufficiently well understood for reasonable assessments to be made as to the likely progress of critical variables such as

consumption and investment, and the impact of particular policy changes. Keynesianism did not accept neutrality of money hypothesis.

Until the end of the 1960s, demand-management seemed to have fulfilled the ambitions of the policy makers particularly on the employment goal. Fluctuations in output were fairly mild and in most "recessions" the growth in output merely slowed to an increase below the long term average. Thus in the UK, between 1950 and 1973, output only fell in one year. Nevertheless, there were still considerable fluctuations in the economy and during the 1970s the authorities seemed to be unable to overcome the cyclical instability. Some commentators observed that demand-management itself was destabilizing and that intervention removed the economy further from target than it would have been if no action had been taken. For example, Artis [1972] examined the stability of GDP in the UK around its trend. For the period 1958 to 1970, the dispersion of quarterly levels of GDP from the time-trend was larger than the dispersion of estimated "policy – off" GDP (i.e. after deducting the effects of all policy changes). However, as Artis [1972] admitted the course of target output to achieve a particular objective(s) may not always coincide with trend GDP. Other evidence supported the viewpoint that discretionary policies did not contribute towards stability included that presented by the OECD in 1969. For the UK, France and Italy the results of demand-management policies were actually destabilizing [OECD, Hensen 1969]. Such evidence can be refuted because the targets that the authorities sought to achieve were not constant over time. Thus while there is evidence that the annual targets for the GDP in the UK did not follow a steady trend, this is not sufficient to conclude that policy was destabilizing if the targets that the authorities chose to achieve changed over time. Nevertheless, the critique offered by commentators such as Artis and Hensen suggested that if the economy was left to market forces, disturbances would prove temporary and 'the invisible hand' will deliver an economy that in the long-run will exhibit stability around its prevailing rate of growth, whilst intervention would exacerbate instability in the economy.

These practical considerations as to the efficacy of demand-management were associated with growing difficulties in the western economies in 1970s and the emergence of new principles governing macro-economic behaviour. Under Keynesianism, policy was based on the requirement to manage demand because of the inherent instability of the economy. Left to its own devices, the economy would deviate from its long-run path and only intervention would restore stable expansion. While policy evolved over time, it remained interventionist in nature. From the mid 1970s the discretionary policy of varying instruments to achieve targets was replaced by the 'rules' approach. This opinion emphasized the idea that the economy was inherently stable. This reflects the greater importance of the long-run in determining crucial variables. For instance, where consumption depends on normal income (the permanent income hypothesis) as opposed to current disposable income (the Keynesian consumption function) one might expect that consumption and therefore aggregate demand to be slow to change following any disturbance. Also if there is a stable relationship between the disposable income of the private sector as a whole (i.e. the personal and company sector) and its expenditure this: "necessarily implies that no component of private expenditure exerts an independent (exogenous) net influence on the level of output or fluctuations in it" [Cripps et al. 1974].

The most important of the 'schools of thought' associated with the rules approach was the Monetarist. The monetarists rejected the idea that there was a stable and predictable choice between unemployment and inflation. At best, only a short-run trade-off existed and governments attempting to pursue employment targets would fail in the long-run, and only boost the level of inflation. Thus, the effects of discretionary demand management were reduced to impotency in the long-run and macro-policy should be properly confined to ensuring low inflation by control of the money supply. The adaptive expectations model meant that there was a possibility of demand-management policies in the short-run, but in the long-run the resulting inflation would necessitate higher levels of unemployment and lower output. In terms of economic stability, government intervention would prove to have the opposite outcomes from those intended. The New Classical version of monetarism went even further by denying that real variables such as output and employment could be influenced by systematic demand-management policies in either the short-run or long-run. There is no trade-off between unemployment and inflation. The only Phillips curve is a vertical relationship at the natural rate of unemployment. This notion is based on 'rational expectations' whereby economic agents acting in their self-interest will modify their behaviour in line with expectations based on the most up-to date information available. Economic agents (workers) do not suffer from money illusion, because if government attempt to expand demand in order to stimulate output and employment this is fully anticipated by decision makers. Behaviour is modified to offset the intervention of the authorities and there will be no effect on the real variables in the economy even in the short-run. If price expectations no longer lag behind inflation, which is crucial to understanding the Phillips Curve trade-off, there is no possibility of moving variables from their natural levels. Rational expectations theory was originally developed by J.F. Muth in 1961, but its application to macroeconomics was made by Lucas in 1972. Expectations which economic agents form about the variables in which they are interested such as the rate of inflation will reflect the efficient use of publicly available information such as the rate of monetary expansion. Agents will form expectations, which will not be systematically wrong over time. One average, expectations will be correct. Such expectations will be rational because the best use is made of the available information. It is not claimed that economic decision-makers all have direct information about the causation process of inflation, but it is argued that it will be possible to utilise such information and that market pressures and information indirectly acquired, such as through the media, with lead economic agents to rational decision-making.

Rational theory implies that unemployment cannot depart from the natural level in any persisting fashion. Employment will deviate from the natural rate as the result of random and unpredictable shocks to aggregate demand and supply. However, subsequent changes in behaviour will restore equilibrium and there is certainly no available short-run Phillips curve available to the authorities. Indeed the actions of the policy makers to influence output and employment will cause shocks to the system. As Artis and others argued, the prescription for stability in the economy is not to manipulate demand as the post-war Keynesians had claimed, but rather to adopt a rule (growth of the money supply) and stick to it without deviation. Fiscal policy became associated with supply-side policies to raise the trend rate of growth. Thus, the role of markets would be enhanced because it is private enterprise that creates growth and employment.

When the 'Iron Curtain' fell at the end of the 1980s, the nearby emergent Central European economies underwent economic liberalization stabilization, and privatization. By moving as quickly as possible towards the market economy, these societies would establish the necessary framework for economic growth. Like their western counterparts, economic growth had not been as stable as might have been expected during the era of socialist planning – as for instance evidenced by the gluts of investments and unfinished capital projects that periodically occurred.

However, questions can be raised as to the validity of the rationality approach. In other words: Does the evidence suggest that the outcomes for the Central European Economies post 1989 have been as the classicals predicted in their rational world, or is 'capitalism wisely managed' the appropriate path for the authorities? The aim then of this study is to provide a justification for certain economic policies with reference to Czech Republic, Slovakia, Poland, and Hungary (CEE 4). By investigating the GDPs and industrial production indices for the CEE 4 economies, it can be determined whether these variables are stable around their trends as the classicals proclaimed and thus state intervention is unnecessary. Any deviations will lead to appropriate changes in behaviour, which will restore equilibrium. Alternatively, if GDP is unstable or stochastic, then the authorities must take action to avoid permanent recessions.

This study can be also regarded as an extension of unit root tests to the post communist countries. It is worth to pointing out that these economies have some specific features such as the specific structure of GDP, socio-economic environment, institutional and legal framework amongst others.

Laissez – Faire: stable trending GDP

The classical economics presumes that the economy follows a trend determined by Solow's neoclassical model [Solow 1956]. It assumes that the long-run component of the GDP is a deterministic trend with short-run fluctuations caused by external shocks. Therefore, Classical economics decomposes real GDP into a long-run trend and a short run stationary cyclical component. The slope of the trend is considered to be determined by long-run factors such as technological growth, fertility, and educational attainment levels. Cyclical deviations from the trend are regarded as demand and supply shocks. These deviations are temporary, which means that their fluctuations are eliminated through reversion to a long-run trend. The Classical economists state that over the long run, macroeconomic variables grow at a constant trend and that any deviations from the trend are only temporary and eventually eliminated by the invisible hand of market. Since these deviations are temporary, recessions do not have any permanent negative effects on GDP and there is no need for activist stabilization policy. The economy will converge to equilibrium represented by trend in long run.

This belief in a deterministic trend is reflected in the common practice of detrending macroeconomic variables using a regression equation. In mathematical terms, classical economics presumes that GDP is a trend stationary variable, which means that it is a sum of a deterministic trend and a stationary process. The GDP is a function of the time and some stationary cyclical component. This fact implies that GDP can be stationarized by estimating and deducting of a trend only. The equation describing GDP can be written as follows

$$GDP_t = GDP_0 + a_1 t + \varepsilon_t \quad [1]$$

where t denotes time and ε_t is a stationary cyclical component, which is a difference between the estimated or expected GDP and the real observed GDP. The direct consequence of trend stationarity is a temporary character of the cyclical component, which vanishes over time. Since this cyclical component always reverts to its mean, it has no permanent influence on the trending variable. In other words, under the assumption of output as a trending variable the recessions have only temporary effects on output that vanish over time as the classical authorities supposed.

INTERVENTIONISM: UNSTABLE STOCHASTIC GDP

The New Keynesian economics regards real GDP as a sum of independent random shocks that do not vanish over time but have permanent influence on the level of the GDP. Cyclical deviations from the trend occur because of the productivity shocks due to technological change. If these real factors cause aggregate fluctuations, then business cycles cannot be viewed as temporary. There is no invisible hand that draws economy back to its long-run trend and long deep recessions are highly likely. Thus from this point of view, the New Keynesian economics provides justification for state interventionism.

The New Keynesian economics in fact assumes that output is a difference stationary variable, which means that it contains a unit root or random walk process. If GDP contains a unit root, it means that GDP is a function of time and the cumulative sum of random disturbances, or error terms. More precisely

$$GDP_t = GDP_0 + a_1 t + \sum_{i=1}^{t} \varepsilon_i \quad [2]$$

where the term a_1 refers to the drift of output. It is evident from the equation 2 that the first difference of the GDP is a sum of constant growth rate and error term or cyclical stochastic component ε_t. Since the error term has variance σ and not one, it is possible that $|\varepsilon_t| > a_1$ which means that this stochastic component completely overtakes the influence of constant growth rate a_1 and GDP deviates from this constant trend in long run [Enders 2004]. In this case, error terms do not have temporary effects. These cyclical random shocks have a permanent effect, because they are not stationary. Output in period t2 is determined by the output in the period t1. This change in output persists in every future period, which means that recessions have permanent effects on output. Therefore, the only possible way of stationarisation is differencing. In other words, there is no trend in GDP, there is only increasing tendency caused by the drift term.

Unit root has also important consequences in terms of theoretical economics. Snowdon and Vane [2005] state that: "If shocks to productivity growth due to technological change are frequent and random, then the path of output following a random walk will exhibit features that resemble a business cycle" [Snowdon and Vane 2005, p. 303]. However, in this case the observed fluctuations in GDP are not deviations from a deterministic time trend. These deviations are fluctuations in the "natural (trend) rate of output"

[Snowdon and Vane 2005, p. 303] caused by a series of permanent shocks. Thus, each productivity shock is permanent and determines a new growth path.

Now, if the issue concerns the justification or legitimacy of economic policy interventions than the question is whether output is trend stationary or difference stationary. Snowdon and Vane [2005] state:

"If business cycles are temporary events, then recessions create no long-run adverse effects on GDP. However, whereas Keynesians feel that such deviations could be severe and prolonged and therefore justify the need for corrective action, monetarists, and especially new classical economists, reject the need for activist stabilization policy, having greater faith in the equilibrating power of market forces and rules-based monetary policy" [Snowdon and Vane 2005, p. 300].

In order to determine whether economies need corrective actions, a distinction must be made as to whether outputs are difference stationary or trend stationary. In other words, do outputs fluctuate around deterministic trend or are they purely stochastic without any clear trend? More precisely, in order to answer the question we need to prove if the equation 3 contains a unit root.

$$GDP_t = GDP_0 + a_2 t + a_1 GDP_{t-1} + \varepsilon_t \qquad [3]$$

Nelson and Plosser's groundbreaking study [1982] indicates that the U.S. GDP is purely stochastic without any stable trends. On base of the Dickey-Fuller test [Dickey and Fuller 1979], they were not able to reject the null hypothesis of unit root in the case of real GNP, nominal GNP, industrial production, and unemployment rate of the United States. In particular, non-rejection of unit root in the case of real GNP had very strong influence on theoretical macroeconomics as well as on practical macroeconomic policy.

"The most important implication of the unit root revolution, is that under this hypothesis random shocks have a permanent effect on the system. Fluctuations are not transitory. This implication, as forcefully argued by Nelson and Plosser, has profound consequences for business cycle theories. It runs counter to the prevailing view that business cycles are transitory fluctuations around a more or less stable trend path" [Perron 1989, p. 1362].

Many other studies dealt with the unit root testing by using U.S. data, as for instance, Rudenbusch [1992], Simkins [2001] or Andreou and Spanos [2003]. Furthermore, Fleissig and Strauss [1999] applied panel unit root tests to examine if real per capita GDP for OECD economies are trend or difference stationary. They conclude that the results fail to reject the null hypothesis of unit root. Similarly, Narayan [2006] explored per capita income of G7 countries in the period 1870–2001. He was able to reject the unit root hypothesis in case of five countries of G7. Smyth and Inder [2003] used real GDP per capita in 25 of China's provinces to test the unit root. They concluded that the evidence supports the unit root hypothesis if they allowed no structural breaks or one structural break. In case of more than one break and in case of breaks in intercept and slope the results were mixed. Li [2000] examines China's output data and concludes that the data are "flexible trend stationary rather than difference stationary" [Li 2000, p. 825]. However, these studies have not examined economies the Central and Eastern Europe and the aim of this paper is to provide an extension of previous studies to the CEE4.

THE TIME SERIES OF DATA

The time series of the GDPs and indices of industrial production were collected form OECD database. The GDP series consist of quarterly values and the series of index of industrial production accounts for monthly values. The longest possible data ranges were deployed. The Table 1 provides data ranges. In case of all time series, logarithms have been taken so that they were used in logarithmic form during all computations. All computations have been conducted by using MATLAB programming environment.

Table 1. Data ranges
Tabela 1. Zakres danych

Country	GDP	Number of Observations	Index of Industrial Production	Number of Observations
Czech Republic	Q1 1996 – Q3 2007	47	January 1989 – November 2007	215
Slovakia	Q1 1995 – Q4 2007	52	January 1990 – December 2007	228
Poland	Q1 1995 – Q4 2007	52	January 1985 – December 2007	277
Hungary	Q1 1995 – Q4 2007	52	January 1985 – January 2008	276

Source: OECD Stats Extracts.
Źródło: OECD Stats Extracts.

AUGMENTED DICKEY-FULLER TEST

When estimating a polynomial trend in logarithms of GDP and index of industrial production series, the autocorrelation functions of regression residuals have a slowly decaying pattern and oscillate around zero. This pattern suggests unit root [Enders 2004]. However, a more exact methodology is applied to the series. The Dickey-Fuller [1979] developed a test to investigate the presence of the unit root. This test is applied to four countries of the former Soviet bloc; Czech Republic, Slovakia, Poland and Hungary. The intention is to demonstrate whether their outputs and indices of industrial production confirm laissez faire policy or active economic interventions. As testing statistics, it has been decided to use the Augmented Dickey-Fuller test [Dickey and Fuller 1979].

It will be tested if the parameter a_1 is greater than one in absolute value in the equation 4.

$$y_t = a_0 + a_1 \cdot y_{t-1} + a_2 \cdot t + b_1 \cdot \Delta y_{t-1} + b_2 \cdot \Delta y_{t-2} + \ldots + b_n \cdot \Delta y_{t-k} + \varepsilon_t \quad [4]$$

The term $b_1 \cdot \Delta y_{t-1} + b_2 \cdot \Delta y_{t-2} + \ldots + b_n \cdot \Delta y_{t-k}$ refers to the lags for corrections of residual autocorrelation. It is worth pointing out that too many lags lead to a loss of degrees of freedom and reduce the power of the test to reject the null of the unit root.

The lag length k is selected using the t-statistics, which is in line with Perron [1994] who argues that the methods based on information criteria are less appropriate. This method sets the number of lagged variables so that the lagged variables are included up to the last statistically significant lagged variable.

In line with Dickey and Fuller [1979], the equations have been transformed by subtracting *yt*–1 from each side so that the model has the following final form:

$$y_t - y_{t-1} = a_0 + \gamma \cdot y_{t-1} + a_2 \cdot t + b_1 \cdot \Delta y_{t-1} + \varepsilon_t \quad [5]$$

where $\gamma = a_1 - 1$. The t-statistic labelled as τ has been used to test the null hypothesis $\gamma = 0$ against the alternative $-2 < \gamma < 0$ by comparing to Dickey-Fuller critical values.

The tables 2 and 3 provide the results of the estimated equations with trend. The equations have the following final forms

$$\Delta GDP_t = a_0 + \gamma \cdot GDP_{t-1} + a_2 \cdot t + b_1 \cdot \Delta GDP_{t-1} + \varepsilon_t \quad [6]$$

for GDP and

$$\Delta IIP_t = a_0 + \gamma \cdot IIP_{t-1} + a_2 \cdot t + b_1 \cdot \Delta IIP_{t-1} + \varepsilon_t \quad [7]$$

for the index of industrial production.

From the tables 2 and 3 it is apparent that the parameter γ is close to zero in all cases, which indicates the unit root. The Dickey-Fuller critical values of τ statistic for 50 observations are –3.5 at the 5% significance level and –4.15 at the 1% significance level [Enders 2004, p. 439]. Therefore, we cannot reject the null hypothesis of unit root in all of the four GDPs at either the 5% or 1% significance level. Since the Dickey-Fuller critical values of τ statistic for 250 observations are –3.43 at the 5% significance level and –3.99 at the 1% significance level [Enders 2004, p. 439], we cannot reject the unit root hypothesis at either the 5% or 1% significance level in any of the four indices of industrial production. The table 4 summarizes these results.

Table 2. Estimated equations of GDP with deterministic trend
Tabela 2. Oszacowane modele PKB z trendem deterministycznym

GDP	a0	γ	a2	b1	τ	R2	Q
Czech Republic	–0.0027	–0.0228	0.0003	0.7734	–3.1450	0.9390	21.4384
Slovakia	0.0017	0.0169	–0.00002	0.5814	0.6140	0.5267	10.5297
Poland	0.0191	–0.1637	0.0016	---	–2.0992	0.0896	7.7864
Hungary	0.0027	–0.0555	0.0006	0.5697	–1.0635	0.3355	18.3708

Source Authors' calculations.
Źródło: Obliczenia własne.

Table 3. Estimated equations Indices of Industrial Production with deterministic trend
Tabela 3. Oszacowane modele indeksów produkcji przemysłowej z trendem deterministycznym

IIP	a0	γ	a2	b1	b2	τ	R2	Q
Czech Republic	0.2287	–0.0545	0.0003	0.5080	0.1754	–2.693	0.2533	35.5816
Slovakia	0.2835	–0.0672	0.0003	–0.4328	–0.3160	–2.3770	0.2167	69.4373
Poland	0.0264	–0.0073	0.0001	–0.3194	---	–0.7971	0.1153	25.3550
Hungary	0.0199	–0.0063	0.0001	–0.4317	---	–0.9031	0.2043	30.0155

Source: Authors' calculations.
Źródło: Obliczenia własne.

Table 4. Acceptance of the null hypothesis at the 1% significance level
Tabela 4. Przyjęcie hipotezy zerowej na poziomie istotności 1%

	GDP		Index of Industrial Production	
	5%	1%	5%	1%
The Czech Republic	Accepted	Accepted	Accepted	Accepted
Slovakia	Accepted	Accepted	Accepted	Accepted
Poland	Accepted	Accepted	Accepted	Accepted
Hungary	Accepted	Accepted	Accepted	Accepted

Source: Authors' calculations.
Źródło: Obliczenia własne.

In order to test residual autocorrelation Enders [2004, p. 188] used the Durin-Watson statistic [Durbin and Watson 1951]. However, Nerlove and Wallis [1966] points out that if lagged dependent variables are included in an equation estimated by ordinary least squares method "the value of Durbin-Watson statistic is asymptotically biased towards 2", which means towards indicating no autocorrelation. Durbin [1970] confirms these findings. Greene [2002] suggests using the Ljung-Box Q test [Ljung and Box 1978] in case of regression equation with lagged dependent variables. Thus, the Durbin-Watson statistic [Durbin and Watson 1951] can be used in case of Polish GDP only, where it has value of 2.157, which indicates no residual autocorrelation.

The column labelled as Q in tables 2 and 3 provides the values of the Ljung-Box statistic at lag 10. The critical value of the $\chi^2_{1-0.05}$ distribution based on the corresponding degrees of freedom is 30.5779 at the 1% significance level. It is apparent that there is no significant residual autocorrelation in six of eight cases; only in the case of Czech and Slovak industrial production does the Ljung-Box statistic indicate residual autocorrelation.

It can be concluded that the outputs and industrial productions of the Central European Countries contain a unit root. These economic variables should be regarded as difference stationary rather than trend stationary. Further investigation is required to test the validity of these findings before conclusive confirmation of the validity of the Keynesian approach to economic management can be made. Such an investigation will be the subject of further research.

CONCLUSIONS

The GDP statistics and indices of industrial production of four Central European countries have been examined in order to find out if their outputs are stable around a deterministic trend or if they are stochastic.

The Dickey-Fuller test indicates unit root in case of all four countries for both the GDP and the index of industrial production. Difference stationarity means that there is no deterministic long-run time trend in either GDP series or index of industrial production series. These series have a growing tendency, which can be completely overtaken by the influence of cyclical fluctuations because these fluctuations have a unit root. Since unit root implies permanent character, long lasting deviations from this growing tendency are

likely. These deviations in fact represent long and deep recessions and confirm Keynes' 'inherent instability of the economy'. In other words, permanent recessions are not only possible but also even very likely. Thus, state interventions in Central Eastern Europe to boost economy during these recessions can be regarded as justified. The results are in line with the Nelson and Posser's study from 1982. The Dickey-Fuller test also indicates unit root in case of industrial productions of all four countries.

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POLITYKA GOSPODARCZA W EUROPIE ŚRODKOWO-WSCHODNIEJ: KONSEKWENCJE PIERWIASTKÓW JEDNOSTKOWYCH

Streszczenie. Celem artykułu jest przedstawienie ekonometrycznego uzasadnienia dla polityki gospodarczej w Europie Środkowej i Wschodniej, w oparciu o badania stabilności realnego PKB i produkcji przemysłowej w Czechach, na Słowacji, w Polsce i na Węgrzech. Stabilność produkcji przemysłowej i PKB badana jest za pomocą testów pierwiastków jednostkowych. Test Dickey-Fullera (1979) wskazuje pierwiastek jednostkowy w przypadku wszystkich czterech państw. W przypadku produkcji przemysłowej rezultaty są różne. Niemniej jednak, stacjonarność różnic PKB oznacza brak trendu deterministycznego PKB, w związku z czym w krótkim okresie nie następuje zwrot trendu. Głęboka i długa recesja są nie tylko możliwe, ale nawet prawdopodobne. Tak więc działania polityki gospodarczej mogą być uznane za uzasadnione, ponieważ mają za zadanie pobudzenie gospodarki w celu odwrócenia recesji. Przedstawione opracowanie stanowi także rozszerzenie testów pierwiastków jednostkowych w krajach postkomunistycznych.

Słowa kluczowe: Europa Środkowo-Wschodnia, ekonomia klasyczna, keynesizm, stabilność produkcji, pierwiastek jednostkowy

Accepted for print – Zaakceptowano do druku – 10.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 69–81*

BUSINESS DEMOGRAPHY ISSUES AND EMPIRICAL RESEARCH ON DYNAMICS OF ENTERPRISES' POPULATION IN POLAND

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Abstract. Business demography allows to measure the performance of enterprises in economy. The case of a country in transition such as Poland is a very interesting one. Despite joining the EU, there is still scarce and low quality data available. In fact, publications of the Central Statistical Office cover only firms registered in REGON (business register), which differs from the actual number of active enterprises. The number of active businesses represents about 60% of total registered firms. This study attempts to identify the most important qualitative and quantitative factors determining births and deaths of enterprises in the context of economic changes during the transition period. Due to limited access to additional surveys the analysis mainly focuses on the available data and covers descriptive analysis based on demographic indicators. Most spectacular results show that the dynamics of business population has been very low in recent years.

Key words: business demography, enterprise population dynamics, enterprise birth rate, enterprise death rate, enterprise survival

INTRODUCTION

Business demography is a research discipline that refers to data collection and the analysis of enterprise population dynamics. An enterprise can enter or leave a market as a result of different events. In many cases, the moment of an enterprise set up is strictly connected to its formal registration, whereas enterprise closure entails a deletion of its record from a business register [Schmiemann, 2006, p. 11]. The problem is that new registration is not always equal to a real start-up of a company. Similarly, the factual end of activity often takes place earlier than the deletion from the register. Data compiled from various countries appears to be additionally biased by differences in the range of observations. Some countries include self-employment in enterprise population

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statistics, while others omit such data. In some states reports concern enterprises, in others local units. In some countries foreign companies are included, in others not. A definition of enterprise birth was established at the EU level [European Commission, Regulation no. 2700/98]. According to this definition, a birth does not refer to a new enterprise that came to life due to a split-up of previously existing unit or a change in the character of activity. As in the case of deaths, takeovers and mergers are not taken into account.

Birth rates and death rates are calculated as a proportion of entries and exits of enterprises during the reference year to the mean number of active enterprises in the reference year (in percent). The difference between these two ratios gives the real dynamics in enterprises population in a given year [Business demography in Europe, Enterprise publications, EC 2002, p. 14].

Birth rates and death rates are calculated according to the following formulae:

$$\text{Birth Rate}_t = \frac{\text{Number of births}_t}{\text{Mean number of active enterprises}_t} 100\% \quad (1)$$

$$\text{Death Rate}_t = \frac{\text{Number of deaths}_t}{\text{Mean number of active enterprises}_t} 100\% \quad (2)$$

Recently the interest in business demography in Poland has increased significantly. First works strictly dedicated to the analysis of the enterprise population dynamics development have appeared. Dominiak and Markowicz's papers [Dominiak 2005, Markowicz 2008] present definitions of business demography as a research discipline as well as detailed definitions of demographic ratios. These works refer to SME sector to a great degree. Studies on bigger companies and corporations were published by Rogowski and Socha [Rogowski, Socha 2005].

Business demography analyses in Poland are not systemized. Markowicz attempts to enumerate some basic measures connected with the description of enterprise population. Author [Markowicz 2008] lists numerous distinct measures, which makes the analysis slightly unclear for the readers. Her understanding of the rate of enterprises emerging and exiting in comparison with the ratio of births and deaths is quite fuzzy.

Some basic measures and definitions coherent with Eurostat publications were introduced by Ptak-Chmielewska in papers published in 2009 and 2010 [Ptak-Chmielewska 2009, 2010].

However, one needs to account for some weaknesses of REGON register measures as they do not clearly specify the real activity moment. A record in a business register does not always mean the actual start of activity. In this paper the analyses are based on measures and definitions presented and published by Eurostat, which allows to make

comparisons between countries. In this paper a birth rate and death rate as measures of dynamics are differentiated following Eurostat.

Analyses of business demography are usually presented in the following subjects: number of births and birth rates; number of deaths and death rate; survival rates; influence on employment.

The classifications used in comparisons are: company size measured by the number of people employed; sector of enterprise activity; geographical situation (EU, new members and candidate countries).

According to such classifications and divisions, the results for Poland in the period 1997–2009 are presented in this paper. Data for 2010 are not available yet.

In this study the analyses of enterprise birth and death processes are based on data concerning private sector only. Data for public sector was excluded. Comparative analyses involving the EU countries are limited to business sector and cover PKD sectors (Polish Classification of Activities) such as C–K without J – financial services and sections M-O.

Indicators in sector analysis concern classification encompassing four groups of activities (according to Eurostat):

- Industry (Sections C–E),
- Construction (Sections F),
- Services (Sections G–K),
- Other services (Sections' M–O).

Analyses with regard to the size of enterprise measured by the number of employees are not presented due to data limitations.

PROCESS OF ENTERPRISES' BIRTHS IN YEARS 1997–2009

For the presentation of changes in the process of enterprise births in Poland the birth rate was used. The birth rate is calculated as the proportion of newly registered firms in the reference year to the mean number of active enterprises in the reference year in percent (see formula 1). The number of active enterprises was taken from estimations made by Chmiel [Chmiel 1997, 1999, 2004]. The estimations covered the period 1993–2002. For the years 2003–2009 the number of active enterprises was assumed to be at the level of ca. 54% of all registered enterprises. 54% is the mean value of the proportion of active to registered enterprises from the years 2000–2002 (last available years from Chmiel's estimations). Real values of calculated rates should be also verified as not all newly register firms start their activity immediately after registration. Such corrections require additional research (unavailable at this moment). Assuming that the proportion of really active start-ups is stable, some conclusions about the tempo and direction of changes can be drawn based on the ratio presented in Figure 1 (data from CSO, 2010).

In the years 1997–2009 the birth rate dropped from over 25% to the level of 15%. In 2002–2005 the rate level was stable and remained slightly above 15%. In the reference year in that period out of 100 active enterprises 15 new firms were born.

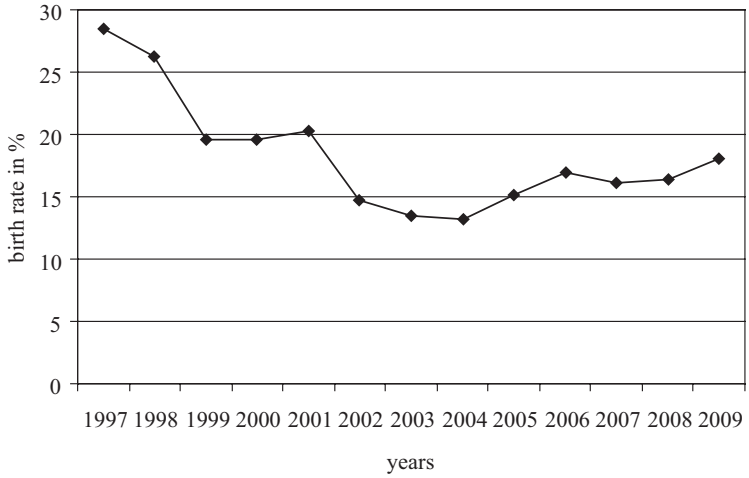

Fig. 1. Enterprise birth rates in Poland, 1997–2009
Rys. 1. Współczynnik „urodzeń" przedsiębiorstw w Polsce, 1997–2009
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie danych GUS.

SECTOR OF ACTIVITY

The analysis with regard to the sector of activity covers four sectors: Industry (sections C–E), Construction (section F), Services (sections G–K) and Other services (sections M–O).

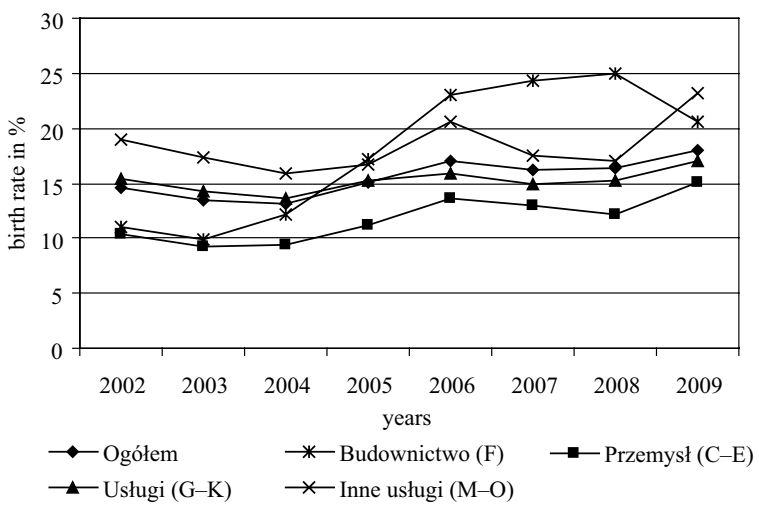

Fig. 2. Enterprise birth rates in Poland – Sector of activity
Rys. 2. Współczynniki „urodzeń" przedsiębiorstw w Polsce wg sektora działalności
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie o danych GUS.

The greatest increase in birth rates was observed in the construction sector. Birth rate for this sector increased from 10% in 2002–2004 to 25% in 2008. The birth rate for "Other services" remained few pp higher than in the industry and services sectors (see Figure 2).

PROCESS OF ENTERPRISES' DEATHS IN YEARS 1997–2009

The analysis of business death process is much more difficult as it is impossible to make adjustments to the definition provided by Eurostat. According to Eurostat's definition, a death means exiting the market with no return within the period of 2 years. In the case of Poland it is difficult to access data at the individual level using REGON register. Further research and calculations are required to reconstruct individual unit history.

A death rate would mean the proportion of the number of enterprises deleted from the register during the reference year to the mean number of active enterprises during the reference year presented in percent (see formula 2).

Data presented in Figure 3 concerns quantities without correction due to no return within 2 years. Assuming that the proportion of returning enterprises is stable, we can conclude on some basic changes in the dynamics of death process.

At present, the death rate amounts to ca. 12%. During the period 1997–2009 the death rate dropped from 18% to 12%. Yet, the trend was not the same during the analyzed period. A downturn trend was noticed in the years 1997–2002, whereas in the years 2002––2009 an upturn trend was observed. The lowest level of the death rate amounting to ca. 7–10% was observed in the period 1999–2004.

The comparison between the birth rate and death rate shows the actual increase in the population of enterprises in Poland.

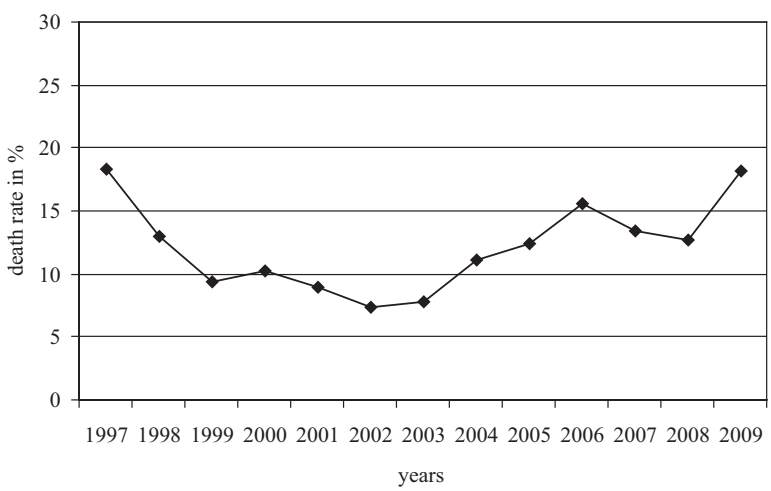

Fig. 3. Enterprise death rates in Poland, 1997–2009
Rys. 3. Współczynniki "zgonów" przedsiębiorstw w Polsce, 1997–2009
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie danych GUS.

SECTOR OF ACTIVITY

The fluctuations in the death rate are very similar for different sectors. The highest death rate was observed in the construction sector. For this area the highest birth rate was also noticed. In the years 2002–2003 the differences between sectors were considerably smaller than in the years 2004–2006. In 2007 decreasing differences between sectors were identified again (see Figure 4).

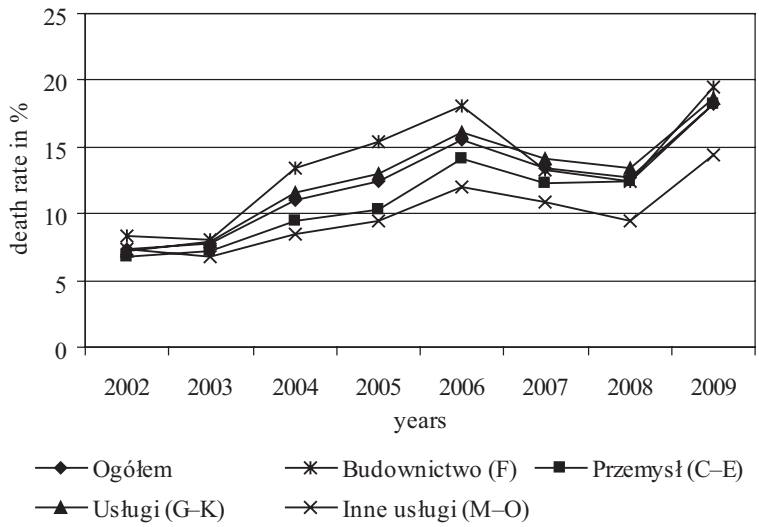

Figure 4. Enterprise death rates in Poland – Sector of activity
Rys. 4. Współczynnik „zgonów" przedsiębiorstw w Polsce wg sektora działalności
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie danych GUS.

ENTERPRISES' SURVIVAL IN POLAND

The difference between birth rates and death rates produces the actual picture of the enterprise population dynamics. The one recorded in the years 1997–2009 for the population of enterprises can be described as positive. In the period 1997–2001 the difference was at the level of 10–12%, in the period 2002–2003 accounted for 6–7%, and in the years 2003–2007 dropped to ca. 2%. After a slight increase in 2008 the difference between the birth rate and death rate dropped to 0, which means almost null dynamics of enterprise population.

Sector of activity

From the perspective of sector division the differences between sectors are significant. In the case of construction sector, for which the birth rates and death rates were the highest, the changes in difference between these rates are the biggest. The dynamics of growth is the highest but only for the period 2004–2008. In 2004 the death rate is higher than

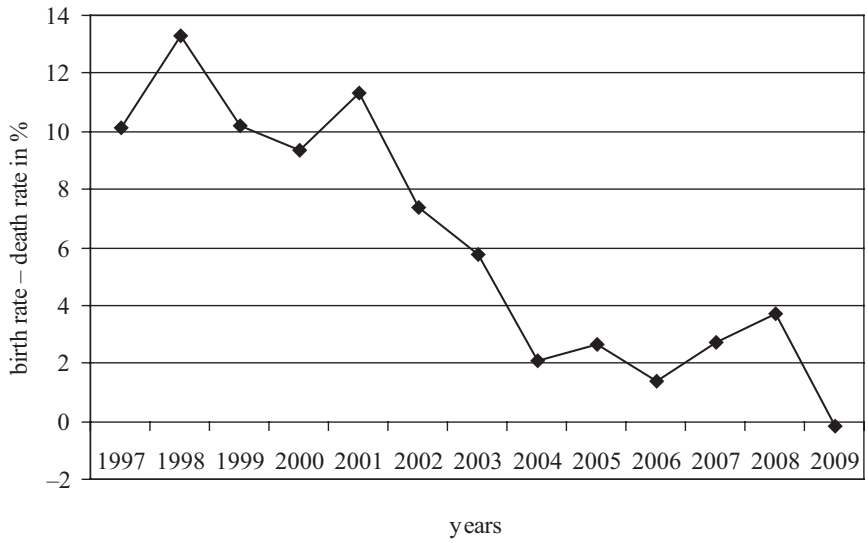

Fig. 5. Difference between the birth rate and death rate of enterprises in Poland, 1997–2009
Rys. 5. Różnica pomiędzy współczynnikiem „urodzeń" i „zgonów" w Polsce, 1997–2009
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie danych GUS.

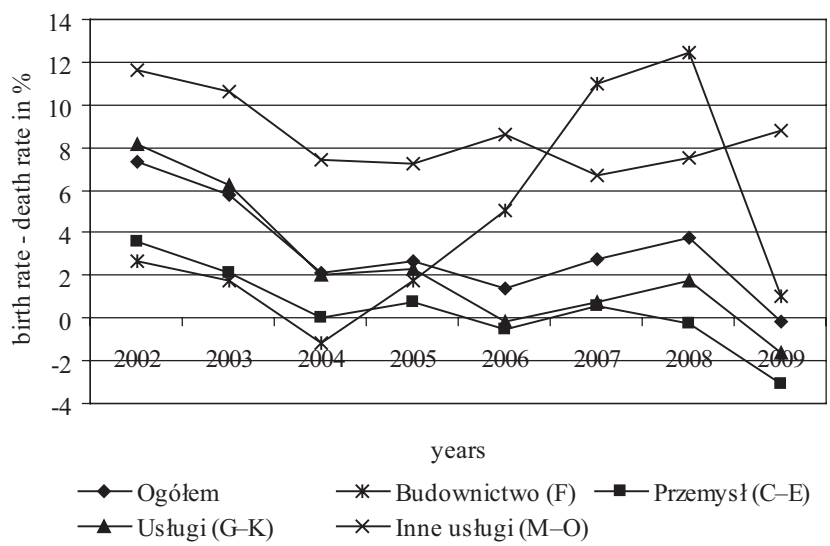

Fig. 6. Difference between birth rates and death rates of enterprises in Poland – sector of activity
Rys. 6. Różnica pomiędzy współczynnikiem "urodzeń" i "zgonów" w Polsce według sektora działalności
Source: Own calculations based on CSO data.
Źródło: Opracowanie własne na podstawie danych GUS.

birth rate for this sector. Since 2004 the difference between the birth rate and death rate for the construction sector has been growing up to 12% in 2008. In 2009 this difference drops dramatically to 1%. The highest difference and therefore the highest dynamics of growth is observed for the sector "Other services" (ca. 2–4 pp higher than for industry and services). For the industry and services the difference between the birth rate and death rate becomes negative for 2009. If this tendency prevails the dynamics for these sectors remains negative and the number of active enterprises decreases. This tendency is very inconvenient for the economic growth in these sectors.

Some very interesting data on small enterprises in Poland was collected by CSO in the panel survey conducted since 2001[1]. This survey is based on a sample of small enterprises. Basic results of this survey are summarized below (information published by CSO annually after each panel is completed):

In 2005 in REGON 211.11 thousand small enterprises (employing fewer than 50 people) were registered (including 208.9 thousand enterprises employing fewer than 10 people). The dominant group consisted of enterprises of private individuals (94.4% of the whole sample). Only one out of four employers declared that they were going to employ new workers.

The most popular form of activity was trade (36.65), real estate and services (18%), construction (11.3%) and industry (9.7%). The most rare activity was business education (1.9%). Majority of new enterprises were completely new units on the market (94.1%). The starting activity was financed with own funds (83.9%), with family and friends funds (6.2%) and bank loans (4.0%).

New companies were statistically more often established by men than women (56.8% and 43.2%). The frequency of new companies set up by men was higher than the mean frequency in construction (87.65), transportation (76.3%), industry (74.4%), real estate and corporate services (61.3%). Women more frequently established new companies in other services (75.6%), education (63.4%), healthcare (62.4%), trade (52,5%) and financial services (52.3%).

[1] Survey is conducted by CSO (Central Statistical Office) since 2002. Each panel covers enterprises newly born in the previous year and observed (re-interviewed annually) during 5 years of their activity. In 2007 the 5th panel was completed for the sample of new enterprises born in 2001. Results of each panel are published annually. The newest publications cover data on completed and non-completed panels. All interviews are conducted in autumn of each 5 year period. In the first panel newly registered enterprises are interviewed. Starting from the second year only still active enterprises are interviewed. No additional observations enter the sample, which contributes to a diminishing amount of enterprises interviewed each year. The survey covers small enterprises (fewer than 50 employees). Survey selection was based on a representative sample covering 3 thousand units (1.4% of population) born in 2001. The survey was based on proportional sampling without replacement, constant fraction with stratum. Results are presented in basic classifications: legal form, size and type of activity. The questionnaire in subsequent years covered information on: activity, legal form, size, development conditions. In the first year there was extra information on the way of entering the market and selected owner's characteristics such as sex, age, education, type of previous employment. Evaluation of enterprise condition used information on the number of workers, range of activity, financial results, investment and barriers.
The completion index was 80–90%. Missing values were imputed by hot-deck method. Weights were used to assure the adequate stratum assumptions.

Majority of people starting new businesses are under 39 years old (66.2%), including 37.2% under the age of 37. The youngest businessmen most frequently started businesses in education (55.5%), transportation (42.9%) and other services (42.1%), and businessmen at the age of 30–39 most frequently opened businesses in healthcare and industry (38,7%, 36,4%). The oldest people – 60 years old and more – accounted for only 3,3% of the population of businessmen opening new firms.

New businessmen in majority completed secondary education (41.9%) and higher education (35%). People with secondary education dominated among such activities as hotels and restaurants (70.2%) and trade (53.6%), while people with higher education dominated in such activities as healthcare (86.9%), education (80.7%), financial services (63.1%) and real estate and corporate services (56.1%).

Before starting a new business 38.1% of people worked as white-collar workers. For 35.7% people own company was the first place of work or they were unemployed before.

According to this panel survey, 2/3 of enterprises born in 2005 survived till the end of 2006 [GUS, 2007, p. 18]. The frequency was higher for legal companies (78.2%) than for private individuals (67%). Higher frequency of survivals was observed for enterprises employing workers (72.1%) than for self-employed (66.45). The highest survival rate was recorded in education and healthcare (81% in both cases). The lowest survival rate was noted for hotels and restaurants (61.7%). As a consequence of differences in survival rates the structure of enterprises at the end of 2006 changed in comparison to 2005. Changes in the type of activities also influenced the structure of enterprises.

The majority of new enterprises (56.6%), declared that following their start they were working only on the local market, whereas only 6.75% entered international markets. Most of newly born enterprises finished their first year of activity with positive financial results. In fact, only one out of five companies recorded losses. In addition, one third of owners decided to start investments. In order to finance investments private funds were used in 69.5% cases and bank loans in 22.4%. Every other owner did not report any problems with production or product sales. Demand barriers and difficulties were reported by one out of three businessmen and only one out of twenty reported supply barriers. Businessmen reporting both types of barriers were in the most difficult situation [see also Balcerowicz 2004].

More interesting data was collected in the fifth panel of survey covering enterprises born in 2001 that survived to the year 2006. Only smallest firms were selected (fewer than 10 workers) for the analyses from the following sectors: industry, construction, trade, hotels and restaurants, transportation and real estate and corporate services. Among 209.4 thousand newly born enterprises registered in 2001 in REGON, in 2006 almost 59 thousand were still active (28.1% of population). This frequency was much higher for legal companies than for private individuals. Higher frequency was also observed for companies employing staff (every other enterprise was active). The highest frequencies were recorded in industry (34%), transportation (30.6%) and real estate and corporate services (30.5%). The lowest survival rate was typical for hotels and restaurants (16.6%). Units active after 5 years are mostly businesses of private individuals (92.7% compared to 95.8% at the beginning). Units without any hired workers after 5 years amounted to 53.8% in comparison to 74.1% at the start. In the 5th year of activity the most frequent

were trade firms. The most stable were units that declared at the beginning such activities as hotels and restaurants as well as trade (99.4% and 90.5% accordingly did not change their type of activity). The most unstable were units declaring transportation and real estate and corporate services as their types of activities (19.7% and 16.3% units accordingly were active in different areas than declared at the start).

CONCLUSIONS

Business demography seems to be a dynamically growing research area. The research focuses on enterprise population dynamics measurement and empirical results. The analysis presented in this paper covers the period from 1997 to 2009. Data availability for earlier years is very limited. The range of various comparisons was restricted to the sector of activity and geographical situation (European Union). The study was based on the estimation of basic demographic indicators such as birth rates and death rates. Main conclusions are the following:

Birth rate for enterprises in the analysed period dropped to ca. 14%, however in last two years we observe a slight increase in this rate.

Death rate for all enterprises in the analysed period increased to the level of ca. 12%. During the period from 1997 to 2009 the death rate decreased and then stabilized at the level of ca. 7–10% The increasing tendency has been observed since 2002 till now.

Decreasing level of birth rate and increasing level of death rate result in slow dynamics of enterprise population in Poland.

Dynamics of enterprise population development measured by the difference between the birth rate and death rate has decreased in recent years reaching 2% (from ca 10% in the beginning of analysed period).

The analyses presented in this paper cover only empirical data studies and do not refer to theoretical background corresponding to the behaviour of enterprises. A research hypothesis is likely to be formulated after the review of theories. Demographic theories were many times verified with the use of analytical tools. With treating the population of enterprises as similar to human population it is possible to verify theories on the behaviour of enterprises using demographic analysis tools. Next steps in business demography research would be the verification of basic enterprise theories with the use of demographic analysis tools.

ANNEX

Data collection for business demography is specified in the Council regulations (EC, EURATOM) no 58/97 dated 20 December 1996 in the range of structural statistics of a business. Basic characteristics such as the number of births and number of deaths of enterprises were defined in Commission Regulation (EC) no 2700/98 dated 17 December 1998 as an annex covering definitions as legal basis for business demography statistics. Data collection is voluntary. Basic source of data in this action is statistical business register. Such registers are built on the basis of few different sources depending on the country.

In the Business Demography Project, NACE Code was used to define the range of basic indicators in calculations. Business economy covers sections C–K and M–O. Data on agriculture, hunting, forestry, fishing, public administration, households with employees, exterritorial organizations, and management activities of holding companies is not collected. Aggregations were done on business economy to: industry (sections C-E) construction (section F) and services (section G–K) and other services (M–O) [Hult M. 2003, p. 7].

Birth (European Commission, Regulation no 2700/98) (all definitions follow EC publications, Eurostat-OECD, 2007) – the creation of a combination of production factors with the restriction that no other enterprises are involved in the event. Births do not include entries into the population due to mergers, break-ups, split-off or restructuring of a set of enterprises. Births do not include entries into a sub-population resulting only from a change of activity. If a dormant unit is reactivated within two years, this event is not considered a birth.

Birth rate – number of enterprise births in the reference period *t* divided by the number of enterprises active in *t*.

Death (European Commission, Regulation no 2700/98) – the dissolution of a combination of production factors with the restriction that no other enterprises are involved in the event. Deaths do not include exits from the population due to mergers, take-overs, break-ups or restructuring of a set of enterprises. Deaths do not include exits from a sub-population resulting only from a change of activity. An enterprise is included in the amount of deaths only if it is not reactivated within two years.

Death rate – number of enterprise deaths in the reference period *t* divided by the number of enterprises active in *t*.

Active enterprise – enterprise that had a turnover or employment in any time during the reference period even in limited time. If no information is available to define the active enterprise, the local country-specific methods are used. Number of active enterprises during reference period is defined as „population of active enterprises".

Survival – is defined as the continuity of an enterprise over time. Thus an enterprise has survived from year t to year t + x if it is still active in year t + x, even if it had a change of ownership.

Survival rate – the number of enterprises in the reference period (*t*) newly born in *t–x* having survived to year *t* divided by the number of enterprise births in *t–x*. In the case of a 2-year survival rate x = 2, in the case of a 5-year survival rate x = 5.

Statistical unit – enterprise – is defined in Council Regulation (EEC no 696/93 of 15 March 1993) – as the smallest combination of legal units that is an organizational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources.

NACE – hierarchical classification of economic activities (Hult, 2003, and Business demography in Europe. Results for 10 member states and Norway. Data 1997–2001, (EC, p. 134), including four levels of economic activities classification:

Level 1 (Section) alphabetical code.

Mid Level (Subsection) two-character alphabetical code.

Level 2 (Division) two-digit numerical code.

Level 3 (Group) three-digit numerical code.

Level 4 (Class) four-digit numerical code.

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DEMOGRAFIA PRZEDSIĘBIORSTW – IDEA I BADANIA EMPIRYCZNE NA DYNAMICE POPULACJI PRZEDSIĘBIORSTW W POLSCE

Streszczenie. Demografia przedsiębiorstw pozwala na pomiar zachowania przedsiębiorstw w gospodarce. Przypadek kraju w okresie transformacji, jakim jest Polska, to bardzo ciekawy przypadek. Brak danych i ich niska jakość są w dalszym ciągu problemem, pomimo wejścia do Unii Europejskiej już w 2004 roku. Dane dostępne w publikacjach GUS zawierają tylko informacje o przedsiębiorstwach zarejestrowanych w rejestrze REGON, które różnią się znacznie od danych o przedsiębiorstwach faktycznie aktywnych na rynku. Liczba aktywnych przedsiębiorstw stanowi ok. 60% wszystkich zarejestrowanych. W badaniach poszukuje się czynników jakościowych i ilościowych determinujących „urodzenia" i „zgony" przedsiębiorstw w kontekście przemian ekonomicznych w okresie transformacji ustrojowej. Ze względu na brak lub ograniczoną liczbę dodatkowych badań analizy koncentrują się głównie na dostępnych danych i ograniczają do analizy opisowej opartej na współczynnikach demograficznych. Najważniejsze wyniki analiz wskazują na bardzo niską dynamikę populacji przedsiębiorstw w ostatnich latach.

Słowa kluczowe: demografia przedsiębiorstw, dynamika populacji przedsiębiorstw, współczynnik „urodzeń" przedsiębiorstw, współczynnik „zgonów" przedsiębiorstw, wskaźnik „przeżycia" przedsiębiorstw

Accepted for print – Zaakceptowano do druku 18.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 83–95*

THE EFFICIENCY OF SELECTED REAL ESTATE MARKETS IN POLAND

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Abstract. Real estate markets (REM) may be classified as strong-form efficient, semi-strong-form efficient or weak-form efficient. Efficiency measures the level of development or goal attainment in a complex social and economic system, such as the real estate market. The effectiveness of the real estate market is a function of the efficiency of individual market participants. This paper comprises two parts. The first part attempts to analyze the efficiency of the Polish real estate market as a feature of general market efficiency. It formulates recommendations for improving market efficiency through the choice of adequate research methods and procedures based on the principles of the rough set theory.

Key words: efficiency of the real estate market, rough set theory, valuation, land management

INTRODUCTION

The real estate market is one of the most rapidly developing commodity markets that attract massive investments, but as an object of research, it poses numerous problems. The market can be analyzed in various categories and from various perspectives. The following determinants can be a source of uncertainty in market evaluations:

a) **market effectiveness** – the achievement of the desired level of development by market structures and functions, the ability to maintain system processes (dynamic and informational balance), crisis survival ability (stability), the ease and possibility of controlling processes in the short-term, mid-term and long-term perspective, and many others;
b) **market structure, namely the configuration of market institutions and organizations** – market structure may be well developed (highly developed markets, e.g. in Great Britain), developing (emerging markets, e.g. in Poland) or weakly developed (e.g. in Belarus);

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c) **market functions** – the ability to satisfy market participants' basic needs and cater to changing demands;
d) **market environment** – the social and economic framework in which the RE market operates and which can be a source of crisis.

The level of knowledge about the market and its participants is a factor that determines the efficiency of the RE market, but is often disregarded in market analyses. Knowledge gaps may originate with active market participants who have limited information about the system and its constituent elements. Other market participants may also have limited knowledge in this area. The knowledge manifested by entities conducting transactions on the RE market is (according to theoretical assumptions) limited or negligent. The above implies that market participants conduct transactions without mutual knowledge which leads to asymmetry in the decision-making process. This could lower the efficiency and, consequently, the effectiveness of the entire market. Researchers analyzing the RE market should also demonstrate a sufficient level of knowledge about the mutual relationships between the subjects and objects of market transactions.

From the analytical point of view, the solution to the problem requires the selection of appropriate **methods for analyzing the available** information rather than, as it is often observed in practice, the adaptation of the existing information to popular analytical methods, such as econometric models. In the era of globalization, quick and unified solutions (procedures, algorithms) are needed to enhance the objectivity and the reliability of research results. The preferred solutions should address the problem on a global scale while accounting for the local characteristics of the analyzed markets and the relevant information.

This study attempts to prove the hypothesis that the efficiency of real estate markets is identifiable and measurable.

CLASSICAL THEORY OF MARKET EFFECTIVENESS AND ITS CONSEQUENCES

Any discussion concerning the efficiency of real estate market participants would be incomplete without a reference to the classical approach to market effectiveness (in particular capital markets). In line with the assumptions made by this study, efficiency determines effectiveness. This chapter discusses the rudimentary concepts of market effectiveness vs. market ineffectiveness, market equilibrium vs. market imbalance, perfect vs. imperfect markets.

According to the random walks hypothesis, developed in 1900 as the pioneer concept in the theory of capital market effectiveness [Bachelier 1900], the expected rate of return on an asset equals zero due to the random distribution of prices. Further research [Osborne 1964] demonstrated that the fluctuation of prices on the capital market resembles Brownian motion, i.e. the movement of particles in a fluid [Gabryś 2006, following Osborne].

According to the random walks theory, this motion does not follow a specific pattern or trend, but it is the effect of completely random changes as a result of which, the prices from the past do not support the prediction of future prices [Szyszka 2003]. According

to subsequent researchers, if prices are to reflect all available information, they should change only when new information appears. Since information enters the market in a random fashion, price changes should also have a random character [Gabryś 2006].

According to Fama [1990], *an efficient market is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants. In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which the market expects to take place in the future*.

Szyszka [2003] argued that if there are irrational investors on the capital market, their actions are random in character and they neutralize each other without affecting the prices. If there is a larger group of irrational investors who make similar decisions, the effects of their actions are eliminated by rational investors through arbitration.

According to pioneer researchers in the area of real estate market efficiency, a market is efficient if its fulfils the following theoretical assumptions:

- it has an infinite number of participants who appraise the value of real estate independently in an effort to maximize the profit generated by real estate,
- a single participant is unable to change real estate prices,
- information that could affect real estate prices is generated in an uncorrelated manner,
- information instantly reaches all market participants,
- information is freely available,
- there are no transaction costs,
- all investors make instant use of the received information,
- every investor has identical expectations as regards the information's effect on real estate prices and the expected return rate,
- all market participants have identical investment horizons.

In line with the above assumptions, prices are determined as follows [cf. http://www.naukowy.pl/...; Grossman, Stiglitz 1980]:

- prices ideally reflect the value of real estate at any moment,
- prices change instantly in response to new information, and they remain stable until new information enters the market,
- higher than average profits cannot be generated in the long run,
- prices change independently.

Throughout decades, researchers came across examples demonstrating that market efficiency theory does not always work. The early 1980s were marked by several anomalies that seemed to undermine the efficiency of financial markets. Those anomalies continue to be studied, while new irregularities are surfacing. A new field of study, behavioral finance, was created to explain the phenomena that contradict the hypothesis of market effectiveness. Behavioral finance examines stock market anomalies by analyzing systematic errors made by humans when predicting the future, a fact that has also been demonstrated by psychological research.

The causes of anomalies on real estate markets differ from those encountered on other markets, including capital markets, due to the specific nature of real estates. The distribution of real estate prices shows an absence of linearity and the presence of anomalies that distort the classical equilibrium and affect the stability of the real estate market. If those two assumptions are not met at the stage of preliminary analysis, the above leads to the formulation of incorrect conclusions, such as the overestimated value of coefficient R^2.

According to Peters [1997, following Pareto], a distribution has fatter tails (suggesting the inefficiency of a market where prices do not follow random walks) when information reaches the market irregularly or when the investors' response to information is delayed. When the information flow exceeds critical values, investors respond to all information that had been previously ignored. This implies that, contrary to Newton's theory where every action produces an instant response, market participants demonstrate a non-linear response to information.

EFFICIENCY OF IMPERFECT REAL ESTATE MARKETS

According to Kucharska-Stasiak [1999] and Bryx [2006], a perfect market has the following attributes:

- there is a large number of buyers and sellers – no participants have sufficient "market power" to set the price of a product, buyers and sellers have to be dispersed,
- product homogeneity (uniformity and full substitution) – when products are homogenous, the decision to buy a given product will be determined by the price rather than variations in the product's nature,
- perfect information (market transparency) – prices and quality of products are assumed to be known to all consumers and producers,
- utility and profit maximization – in addition to maximizing their profits, decision-makers also attempt to maximize their security or significance,
- zero entry or exit barriers – a competitive market is freely available to all participants, owners can move their capital to market segments generating higher revenues, the capital market is marked by a high degree of liquidity.

The following factors contribute to real estate market imperfections:

a) speculation,
b) monopolistic practices, such as the policies adopted by municipalities,
c) large spread between prices quoted for similar real estates – the prices on local markets, in particular weakly developed markets, may differ even several-fold due to:
   - unavailability of information,
   - specific features of a transaction,
   - specific features of real estate,
   - financing method,
   - subjective evaluation of real estate's utilitarian value,
   - underestimation of prices in property deeds,
d) low asset liquidity – real estate is difficult to sell at a price equal to its market value,
e) sporadic market equilibrium – on the real estate market, supply and demand are usually out of balance due to:

- market outlook,
- fluctuations in return rates,
- specificity of the local market,
- the return on alternative investments,
- situation on the construction market,
- state policy,
- frequent legislative changes,

f) small number of transactions – real estate is turnover is low,
g) irrational behavior – buyers' and sellers' decisions are influenced by factors other than the price, including trends, neighborhood, tradition and advertising. Irrational behavior may result from:
   - subjective evaluation of real estate's utilitarian value,
   - unequal access to market information,
   - mutual dependencies between parties,
   - acting under coercion,

h) insufficient information,
i) differences in interpreting data.

According to the authors, the inefficiency of real estate markets results from a small number of transactions and the unavailability of vital information about the transaction and its parties. Such information is difficult to accumulate without database systems. It is also difficult to interpret without extensive analyses of functional dependencies between various attributes of real estate. The determination of the effect that real estate attributes have on a selected decision (e.g. price) may also prove problematic.

From a different perspective, the ineffectiveness of the Polish real estate market has a number of positive outcomes, including above average profits and rates of return on real estate investments. Transactions usually entail the conviction that real estate is worth more than the price paid upon acquisition and that is worth less that the price paid upon sale. High profits and high rates of return on real estate investments would be very difficult to achieve on an effective market.

The discussed attributes of a perfect market affect the efficiency of the real estate market. Each characteristic applies both on the macro (market) and micro (participants) scale. This is not to imply, however, that those attributes deliver similar effects. Their outcomes are evaluated from different perspectives.

The efficiency of the real estate market is inseparable from the efficiency of its participants who are the market's driving force and the final decision-makers. In broad terms, the efficiency of market participants is determined by their ability to achieve specific goals through the maximum use of the available information. Efficiency is measured in terms of the outcomes of their actions, and it is determined by the relationship between the borne outlays and the achieved results, but on the real estate market, those goals are not always optimal from the economic point of view.

The **efficiency of the real estate market** is the individual participant's ability to achieve the set goals, while **market effectiveness** is level of development or goal attainment in a complex social and economic system, such as the real estate market. This paper attempts to define the factors that determine the efficiency and, consequently, the effectiveness of the real estate market.

ANALYSIS OF THE EFFICIENCY OF SELECTED RE MARKETS IN POLAND

Data from various real estate markets in Poland for 2008–2010 are presented in Table 1 with reference to population statistics. The analyzed data constitute a benchmark for measuring the size and efficiency of real estate markets in selected Polish cities, and it accounts for: population, unemployment rate, average gross monthly wages, area in square kilometers, number of real estate transactions separately for land plots and apartments, and the average price per sq. m. of apartment area. The data have been used to analyze real estate market efficiency. At this stage of the analysis, the choice of data was dictated by the ease of acquisition and the availability of the relevant information. The real number of transactions on a given local market (city) proved to be most problematic. It could be postulated that the level of difficulty with acquiring the relevant data was reversely proportional to city size (population and area). According to the authors, the above theory is supported by the following arguments:

- lack of data gathering systems in the public domain,
- lack of data sorting algorithms in units and departments responsible for data accumulation,
- lack of advanced systems for updating, processing and releasing data,
- the units and departments responsible for gathering public information are reluctant to create access to the data.

If the efficiency of Polish real estate markets were to be evaluated based on the criterion of data availability, the majority of Polish cities would receive low or very low marks. Access to information is an important, yet not the only factor determining market efficiency. Two indicators were computed based on the assumption that the acquired data are credible:

1. **PO/RET –** population per 1 real estate transaction,
2. **HA/GW** – housing area in square meters that can be purchased with an average gross monthly wage.

The two indicators can be used to perform a simplified classification of the efficiency of selected real estate markets in Poland. The first indicator, PO/RET, indicates the size of the local population per 1 real estate transaction, and the higher its value the lower the efficiency of the local market. The second indicator, HA/GW, is a price to income ratio that measures the affordability of real estate, and the higher its value, the higher the efficiency of the real estate market. The value of the second indicator illustrates the correlation between real estate prices and incomes on the local market.

Real estate markets are ranked according to the adopted indicators in Tables 2 and 3. An analysis of Table 2 data indicates that a given market's place in the ranking is not determined by the size of the city, its population or the unemployment rate. The ranking is topped by medium-sized cities with a population nearing 100,000 – Zielona Góra, Koszalin and Słupsk. Table 3 suggests a certain trend, namely that real estate prices are more affordable in smaller cities, in this case – Ciechanów, Działdowo and Kętrzyn. An analysis of both tables shows a certain analogy as regards similar positions occupied by Bydgoszcz, Łódź, Suwałki and Ełk.

Table 1. Efficiency of real estate markets in Poland
Tabela 1. Sprawność rynków nieruchomości w Polsce

No.	City	Population	Unemployment rate	Gross monthly wage in PLN	Area in km^2	No. of transactions		Average price PLN/m^2	Population/No. of transactions [PO/RET]	Average wage/ /Average price per m^2 [HA/GW]
						Land plots	Apartments			
1	Olsztyn	176457	4.5	2830	88.33	224	717	4765	188	0.59
2	Słupsk	97331	9.2	2667	43.15	91	816	3783	107	0.70
3	Suwałki	69448	13.4	3645	66.00	270	124	4433	176	0.82
4	Ciechanów	45270	5.7	2994	32.51	131	182	2503	145	1.20
5	Wrocław	632162	5.0	3415	292.82	159	2661	6740	224	0.51
6	Działdowo	21644	6.6	2546	11.47	17	60	2401	281	1.06
7	Inowrocław	76137	20.4	2789	30.42	11	25	3443	2115	0.81
8	Gdańsk	456591	5.1	4053	261.68	26	1728	6215	260	0.65
9	Kraków	755000	4.6	3424	326.00	127	2298	7260	311	0.47
10	Koszalin	106987	4.7	2932	98.33	258	805	4112	101	0.71
11	Kętrzyn	27942	27.5	2423	10.35	9	31	2345	698	1.03
12	Toruń	193115	8.3	3175	115.75	49	252	4666	642	0.68
13	Gołdap	13514	5.7	2361	17.20	4	5	2432	1501	0.97
14	Poznań	554221	3.3	3669	261.85	83	1292	5800	403	0.63
15	Łódź	742387	9.5	3159	293.25	251	2165	4666	307	0.68
16	Bydgoszcz	357650	7.3	2830	175.98	61	1235	4125	276	0.69
17	Zielona Góra	117503	7.5	3060	58.00	12	615	3446	91	0.89
18	Ełk	57579	12.2	2584	21.00	72	252	2990	178	0.86
19	Elbląg	127954	16.5	2521	38.94	87	821	3894	141	0.65
20	Białystok	294685	11.6	3145	102.00	74	324	4660	740	0.67

Source: Own research based on: http://www.stat.gov.pl/cps/rde/xbcr/gus/PUBL_PBS_transakcje_kupna_sprzedazy_nieruch_2008.pdf; http://www.mi.gov.pl/2-492414ae09dd9-1793287-p_1.htm; www.money.pl; www.egospodarka.pl, www.gratka.pl, www.oferty.net.pl, http://www.stat.gov.pl/cps/rde/xbcr/gus/PUBL_ik_obrot_nieruchomosciami_2009.pdf, information given by municipal housing departments.

Źródło: Opracowanie własne na podstawie: http://www.stat.gov.pl/cps/rde/xbcr/gus/PUBL_PBS_transakcje_kupna_sprzedazy_nieruch_2008.pdf; http://www.mi.gov.pl/2-492414ae09dd9-1793287-p_1.htm; www.money.pl; www.egospodarka.pl, www.gratka.pl, www.oferty.net.pl, http://www.stat.gov.pl/cps/rde/xbcr/gus/PUBL_ik_obrot_nieruchomosciami_2009.pdf, informacji udzielonych przez pracowników urzędów miast.

Table 2. Market efficiency in terms of population size per one RE transaction
Tabela 2. Sprawność rynku wyrażona wskaźnikiem liczby mieszańców przypadających na jedną transakcję

No.	Real estate market	Population/No. of transactions [PO/RET]
1	Zielona Góra	91
2	Koszalin	101
3	Słupsk	107
4	Elbląg	141
5	Ciechanów	145
6	**Suwałki**	**176**
7	**Ełk**	**178**
8	Olsztyn	188
9	Wrocław	224
10	Gdańsk	260
11	**Bydgoszcz**	**276**
12	Działdowo	281
13	**Łódź**	**307**
14	Kraków	311
15	Poznań	403
16	Toruń	642
17	Kętrzyn	699
18	Białystok	740
19	Gołdap	1502
20	Inowrocław	2115

Source: Own research.
Źródło: Opracowanie własne.

The above analysis is only a preliminary attempt at determining the efficiency of real estate markets in Poland, and its main aim is to indicate the direction of research initiated by the authors. The area of research will be expanded in successive papers to include a comparison of data relating to real estate transactions and market offers, market classification and an efficiency ranking of the examined real estate markets based on other indicators presented in Table 1.

Table 3. Market efficiency in terms of real estate affordability – the number of square meters that can be purchased with average monthly wages
Tabela 3. Sprawność rynku wyrażona wskaźnikiem przedstawiającym możliwość zakupu jednego metra kwadratowego nieruchomości mieszkaniowej za średnią miesięczną płacę

No.	Real estate market	Average wage/Average price per m^2 of housing area [HA/GW]
1	Ciechanów	1.20
2	Działdowo	1.06
3	Kętrzyn	1.03
4	Gołdap	0.97
5	Zielona Góra	0.89
6	**Ełk**	**0.86**
7	**Suwałki**	**0.82**
8	Inowrocław	0.81
9	Koszalin	0.71
10	Słupsk	0.71
11	**Bydgoszcz**	**0.69**
12	Toruń	0.68
13	**Łódź**	**0.68**
14	Białystok	0.67
15	Gdańsk	0.65
16	Elbląg	0.65
17	Poznań	0.63
18	Olsztyn	0.59
19	Wrocław	0.51
20	Kraków	0.47

Source: Own research.
Źródło: Opracowanie własne.

THE USE OF THE ROUGH SET THEORY IN ANALYSES OF REAL ESTATE MARKET EFFICIENCY

This study addresses a common problem encountered during advanced analyses of real estates, namely the choice and use of analytical and research methods that account for the specific nature of real estate data. As suggested in the preceding parts of this pa-

per, the following factors contribute to the inefficiency and ineffectiveness of real estate markets:

- significant variations in the quantity of available information, subject to the type of the analyzed market (region),
- complex methods of data description (differences in the scale of attribute description) – the same attribute can be described in a variety of ways using different evaluation scales,
- significant differences between real estates (no two real estates are identical),
- various criteria for using real estate (every real estate can be used and managed in a variety of ways),
- lack of comprehensive information (due to the lack of homogenous systems for gathering real estate data which results in limited and incomplete knowledge about real estate and market prices),
- inaccurate and "fuzzy" character of real estate data (caused by stochastic factors which reflect random processes that escape the generally acknowledged cause-and-effect market relationship),
- absence of homogenous functional dependencies between real estate attributes,
- decision-making strategies represented by the value, function and method of real estate management.

According to the authors, popular analytical methods (mostly statistical) are relatively ineffective in weak-form efficient real estate markets. The preferred methods and procedures should account for the following defects in real estate data: absence of data, small number of transactions, significant variations in attribute coding, non-linear correlations between the analyzed data and the type of the underlying market. The applied methods should support market analysis at the potential (theoretical) and actual (applied) level. The below solutions (Table 4) that rely on the rough set theory may offer an effective alternative to popular analytical methods. References to detailed studies are indicated in parentheses.

The process of managing real estate resources is problematic due to the specificity of real estate information. Owing to the complexity and diversity of data sets, the decision-making process in managing the resources of the largest property owners in Poland, such as municipalities or Polish State Railway companies, is wrought with problems. The greater the responsibility, the more difficult this process which affects not only the owner's financial performance but also the spatial, economic and social development of urban areas. The authors have concluded that the application of the rough set theory in real estate market analyses may deliver positive results (compare with Table 4). As demonstrated by Table 4, the use of the rough set theory for developing decision trees could enhance the effectiveness of the decision-making process in real estate management.

The rough set theory can also be applied in real estate appraisal on markets characterized by quantitative and qualitative defects. As demonstrated by the results of studies referenced in Table 4, market analyses can produce reliable results even when the number of transactions is small and when different attribute registration methods are applied. The procedure proposed by the authors does not require the development of complex models, preliminary analyses or the adjustment of the available data sets. In the approach based on the rough set theory, decisions are made based on "raw data" in line with the principles

Table 4. The use of the rough set theory (RST) for improving real estate market efficiency
Tabela 4. Zastosowanie teorii zbiorów przybliżonych (TZP) do poprawienia sprawności rynku nieruchomości

RST-based methods for analyzing the real estate market		
General problem	Detailed problem	Solution
Selection of methods for managing and using buildings and apartments [Renigier 2006]	Analysis of the real estate market using various methods for registering real estate attributes without data loss [Renigier 2008]	Option of analyzing data sets without the risk of data loss when quantitative attributes are replaced with qualitative attributes
Real estate appraisal on markets characterized by limited resource availability [Renigier 2008]	Real estate appraisal involving limited data sets [Renigier 2008]	Real estate appraisal based on expert data sets, with high confidence in results
Selection of functions assigned to land on ineffective real estate markets [Renigier-Biłozor, Biłozor 2009]	Determining the significance of real estate attributes without the use of statistical methods [Renigier-Biłozor, Biłozor 2009a, 2009b]	Reliable verification of the significance of attributes adopted based on a limited data set
	Determining weighing factors for real estate prices [Renigier-Biłozor, Biłozor 2009c]	Determining the significance of attributes without the use of statistical tests
Real estate appraisal based on limited market data [Renigier-Biłozor 2010]	Supplementing the missing real estate attributes [Renigier-Biłozor 2010]	Determining the value of the missing real estate attributes based on the analyzed data set

Source: Own research.
Źródło: Opracowanie własne.

of Boolean logic, i.e. a given decision (real estate value) is made if given conditions (real estate attributes) are fulfilled.

The diversity and imprecision of real estate attributes, the extensiveness and complexity of the scope of data and relatively high variability over time make decision-making in real estate management a difficult process that is burdened with considerable risk. The use of the rough set theory and the valued tolerance relation in the decision-making process produces satisfactory results. Problems that cannot be tackled by statistical analyses alone may be solved with the involvement of the proposed method whose outcomes are easy to implement and interpret.

The application of the rough set theory also supports the identification of the key attributes and core characteristics of real estate based on the available data. As demonstrated by the studies referred to in Table 4, the proposed procedure can be applied to investigate the effect of real estate attributes on the analyzed decision-making problem.

The lack or unavailability of data poses one of the greatest obstacles hindering the exploration of real estate market information. Table 4 cites a quick and simplified procedure for supplementing the missing information in data sets used for market analyses. It is based on the principles of the rough set theory aided by the valued tolerance relation. This solution is particularly suitable for markets that are weak-form efficient as regards information availability.

CONCLUSIONS

The efficiency of real estate markets is a problem that escapes an easy definition and a crucial factor that determines the selection of appropriate procedures and methods for market analysis. This paper identifies factors that influence the overall efficiency of real estate markets and, consequently, the entire market system in Poland. Weak-form efficiency of a real estate market could generate positive outcomes, such as above average profits. Market inefficiency, however, always produces negative consequences which lead to the selection of inadequate analytical methods, unreliable results and misguided decisions due to the type, availability and quality of information on the real estate market.

The venture point for every analysis of real market efficiency is the selection of adequate research methods that account for the market's specific attributes and produce results applicable to other local markets. Owing to their individual character, local markets require suitable analytical tools, such as the proposed method based the rough set theory which was initially developed to analyze "difficult", fuzzy and inaccurate data. Methods based on the principles of the rough set theory and the valued tolerance relation may constitute a valuable tool for evaluating the efficiency of real estate markets.

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SPRAWNOŚĆ WYBRANYCH RYNKÓW NIERUCHOMOŚCI W POLSCE

Streszczenie. Rynki nieruchomości (RN) mogą być sprawne lub małosprawne, efektywne, małoefektywne lub nieefektywne. Efektywność to osiąganie określonego poziomu rozwoju (celu) przez złożony system społeczno-gospodarczy, jakim jest rynek nieruchomość. Efektywność rynku nieruchomości (efektywność systemu RN) jest w tym przypadku funkcją sprawności jednostkowej uczestników rynku. Opracowanie składa się z dwóch części. Przedstawiono próbę zdiagnozowania sprawności rynków nieruchomości w Polsce jako element ogólnej jego efektywności. Zaprezentowano również sposób na poprawę jego sprawności poprzez dobranie odpowiedniej metody i procedury badawczej, w tym wypadku opartej na teorii zbiorów przybliżonych.

Słowa kluczowe: sprawność rynków nieruchomości, zbiory przybliżone, wycena, gospodarka nieruchomościami

Accepted for print – Zaakceptowano do druku 18.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 97–108*

FINANCIAL RESULT ANALYSIS OF AGROTOURISTIC FARMS ACTIVITIES IN SIEDLCE REGION

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Abstract. In order to estimate the financial result of tourism activities in 2006 and 2007, 87 farms providing touristic services in the region of Siedlce were examined. Questionnaire, consisting of 27 questions regarding the size of the accommodation and the economic aspects of touristic activities, was sent to the farms owners. The obtained data were analyzed graphically and in form of tables as well as used them to calculate the following economic indicators: the economic size and the rate of rural recreational space, the index of the average number of nights and indicators analyzing the income compared to the demand (POR) and the supply (Yield). The value of direct costs, revenue and gross margin were also calculated. Statistical analysis was conducted by calculating the Pearson correlation coefficient (r) and coefficient of determination (R^2). The study showed that in touristic farms in the Siedlce region in 256 rooms, mostly 2- and 3-beds, there are 673 beds. The average annual gross margin of touristic activities amounts to the value in the range of 2,383.1 to 12,878.96 PLN z and this value proved to be significantly correlated with the attractiveness rate of the particular rural recreational space.

Key words: Siedlce region, agro-tourism, the gross margin, accommodation

INTRODUCTION

In the last two decades one can observe a very strongly growing involvement of the Polish countryside in the development of non-agricultural activities, which are the source of additional income as well as support for the functioning of agricultural holdings [Dębniewska and Szydłowski 2007]. Such undertakings, agritourism being one example, are of interest to many researchers from different disciplines. Under the current legislation, agri-tourism is defined as the business of providing tourist services on the farm [Act on Tourism Services, of 29 August 1997 (Dz. U. of 2004, No. 223, item 2268, as amended)].

At the base substance of agritourism is the belief that the farm is an essential subject of tourist services [Makarski 1999, Woźniak 2002, Kutkowska 2003]. Some authors like

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Jalinik [2002] and Firle [2000], in their studies on the classification of entrepreneurship in rural areas, rate agritourism as non-agricultural activities only indirectly related to agriculture, alongside such non-agricultural activities as agricultural produce processing, trading and public utility services. Moreover, the authors see it as an opportunity to improve farmers' household budgets by renting rooms, recreational equipment, selling meals, their own articles and produce [Migdal 1999, Karczewska 2003]. In any enterprise, and thus in the farm providing tourist services, it is the profit that is the measure of financial viability and business economic efficiency. Properly operating and efficiently managed, the farm should achieve a positive financial result [Dębniewska and Szydłowski 2007].

The objective of this study was to estimate the earnings from tourism activities in Siedlce region, to analyze the income of accommodation services on the background of supply and demand and to examine the relationship between the attractiveness of rural recreational space and the value of gross margin generated by tourism.

MATERIAL AND METHODS

The study was conducted in 2006 and 2007 in 87 agro-tourist farms operating in the region of Siedlce. Siedlce Region, according to the Guide Agritourism – Mazowsze [2005], includes six districts: Sokołów, Siedlce, Węgrów, Łosice, Garwolin and Mińsk. The study was carried out by means of direct interview method. A questionnaire containing 27 questions was sent to farm owners. The questions were related to the size of accommodation and economic aspects of tourism. The obtained data was compiled graphically as well as in the form of a table. Also, the given information was used to calculate the following indicators and economic values:

1. The Indicator of rural recreational space (in points) – it is the value assessing natural environmental values. The above ratio was calculated according to the formulas given by Dubel [2002]. The surface of arable land, meadows, pastures, forests and urban land were adopted from the data published on the website of the Statistical Office in Warsaw [www.stat.gov.pl/workshops.]. The data concerning the area of flowing and standing surface water in various districts of Siedlce Region was obtained from the Office of the Marshal of the Mazowieckie Voivodship, and developed by the Head Office of Geodesy and Cartography in Warsaw.
2. The Indicator of the average number of overnight stays: calculated as the quotient of the number of overnight stays in a given time (per year) and the number of beds (calculated according to formulas given in my paper "Recreational and Special Tourism" 2003).
3. Indicators analyzing income against demand (POR) and supply (Yield) [Kotaś and Sojak 1999]:
   - POR (Per Occupied Room) – accommodation services revenue attributable to one sold bed, calculated as the quotient of total revenue and number of beds sold during the year.
   - Yield – Total income from accommodation services attributable to one available bed (revenue per available room night), calculated as the quotient of income and the number of beds.

4. To calculate the costs of meals, the daily demand for food products per one tourist was estimated [Szarek 2006] assuming that the raw materials for obtaining these products come from our own farm, and if they are not used in meals, they will be sold. Therefore, retail purchase price included individual products and goods [The Statistical Yearbook of Agriculture and Rural Areas 2008]. Daily consumption of oil, sugar, coffee, tea and other items not produced on the farm is based on the average monthly consumption of food for one person in the household according to the Statistical Yearbook by CSO, 2008. The price included the cost of cereal milling based on the data from five mills operating in the test region. Moreover, the price of poultry meat and pork also included the price of livestock, the cost of slaughter, slaughter efficiency for pork and poultry and the cost of veterinary carcass examination, according to prices from local slaughterhouses [Osek and Milczarek 2005, Osek et al. 2007]. The above calculation does not include the farmer's own labor. However, the consumption of water and energy necessary to prepare meals is included in the daily maintenance of the tourist.
5. To calculate the estimated cost of maintaining the tourist, excluding food, the daily consumption of electricity, gas and water was taken into account in households of one person between 2006 and 2007, according to the Statistical Yearbook of the Central Statistical Office [2008]. The coal consumption for heating residential buildings was taken from Gradziuk [2001] and calculated for the surface of a residential building in particular household farms in Siedlce Region. The prices per unit of the above articles were provided by the CSO Statistical Yearbook [2008]. However, the cost of waste disposal, washing powder and other detergents was obtained in direct interviews with the respondents and the average cost per tourist was calculated on the basis of the average cost for the whole population. In a similar way, the value of the costs of promotion and advertising were defined. However, the following aspects of the daily cost of maintaining the tourist were not taken into account: the initial costs incurred prior to commencement of business operations, interest on loans, residential building depreciation, amortization of furniture, bedding, towels, kitchen equipment, tableware and the farmer's own labor.
6. Direct Revenue (in zlotys) was calculated for each farm by multiplying the number of sales of services (accommodation, food) and the unit price of services.
7. Direct Surplus (in zlotys) was calculated for each farm as the difference between the sum of direct costs in the prices of food and maintenance cost per tourist and the value of direct income.

These economic indicators and economic values were statistically analyzed by calculating the Pearson linear correlation coefficient (r) defining the degree of linear relationship between the measured variables and the coefficient of determination (R^2) as a measure of strength of the relationship between variables.

CHARACTERISTICS OF THE TOURIST FARMS

Human resources on the farm play an important role both in making production decisions and in non-agricultural development of commercial ventures, especially those based on interpersonal relations. Many authors [Strzembicki and Kmita 1994, Brelik

2007] point out that a very important element influencing the decision about running agri-tourist activities is the age of the farm owners. The results of this study indicate that this activity is undertaken mainly by people raging in age from 40 to 50 (Figure 1), who are open to changes and innovations. The second largest group were people of fifty to sixty years of age. A significant part in the study was the population in their thirties and forties. Also, farmers over sixty took part in the study. It is worth noting that farms run by people under 30 can be found only in two districts of Siedlce Region.

Another important feature of agri-tourist farms is education. In the literature [Kobyłecki 2003], it is noted that those with secondary or higher education are more open to the situation of "sharing" family life with others, often strangers. In general, they have good interpersonal skills and they are polite. Such personality traits should also characterize the farm owner's family members, because tourism, as a form of leisure on the farm, involves social interaction between the whole farmer's family and tourists. Farms in all the districts of Siedlce Region are mostly run by people with secondary education (Figure 2). There were only in a few cases, in the farms located in the district of Minsk and Łosice, of farmers with higher education engaged in agritourism.

In the opinion of many authors [Gąsiorowska and Zarzecka 2006, Żbikowski et al. 2006], agrotourism, as an additional activity carried out on a farm, should be the domain of small and medium-sized farms, where agricultural production is an insufficient source of income for the farmer.

From the research by Balińska and Sikorska-Wolak [2001], conducted in the Valley of the Bug, it appears that the average size of farms in the region amounted to 11.9 ha. The results of this study show that the agritourist farms acreage of Siedlce Region was very diverse. The average size of these farms was 7.07 ha. While analyzing the size of agritourist farms (Figure 3), it should be noted that the territorially largest ones belonged to the district of Mińsk and Garwolin (an average of over 8 ha); while the smallest holdings were in the district of Sokołów (5.78 ha).

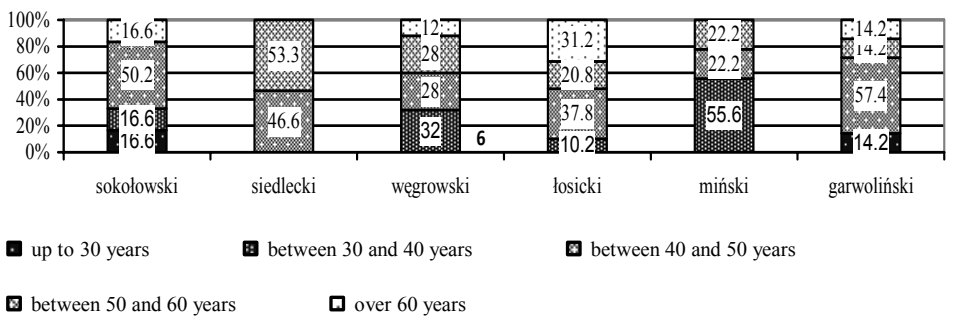

Fig. 1. The age structure of farm owners in various districts of the region of Siedlce (means from farms)

Rys. 1. Struktura wieku właścicieli gospodarstw w poszczególnych powiatach regionu siedleckiego (średnia z gospodarstw)

Source: Authors' research.

Źródło: Badania własne.

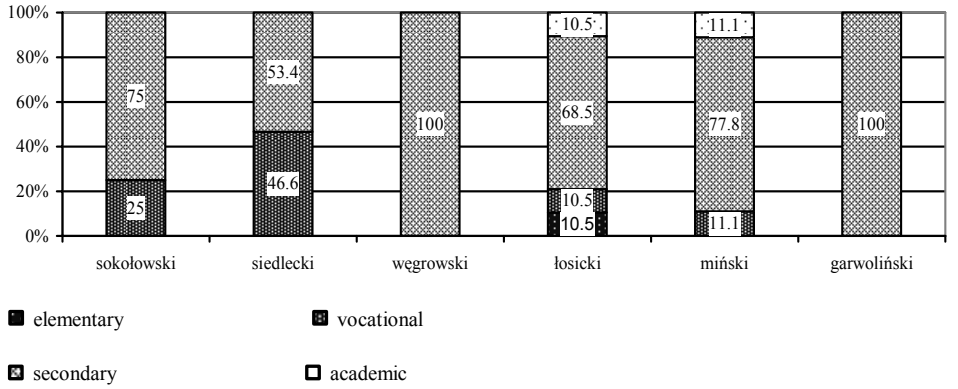

Fig. 2. The educational structure of the owners of touristic farms in various districts of the region of Siedlce (means from farms)
Rys. 2. Struktura wykształcenia właścicieli gospodarstw agroturystycznych w poszczególnych powiatach regionu siedleckiego (średnia z gospodarstw)
Source: Authors' research.
Źródło: Badania własne.

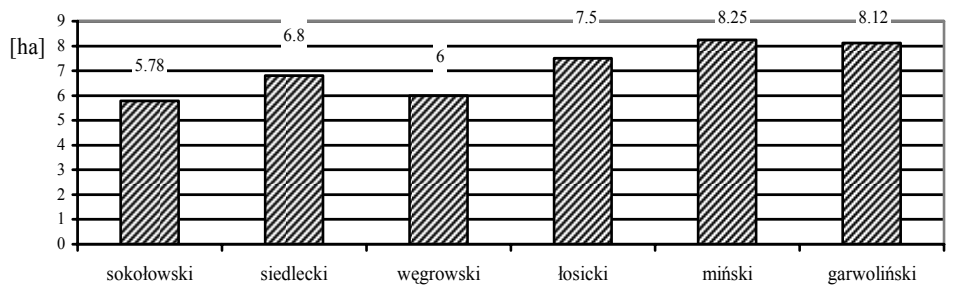

Fig. 3. The size of farms in various districts of the region of Siedlce (means from farms and years 2006–2007)
Rys. 3. Powierzchnia gospodarstwa agroturystycznego w poszczególnych powiatach regionu siedleckiego (średnia z gospodarstw i z lat 2006–2007)
Source: Authors' research.
Źródło: Badania własne.

In the region of Siedlce over 30% of tourist farms has been run for 5 to 7 years. In the region there were also holdings which have been dealing in rural tourism for 10 years. 258 rooms with 673 beds accounted for accommodation facilities in 87 agro-tourist farms (Table 1). In most rooms, it was also possible to use additional beds. It needs to be pointed out that farms offering 2 or 3 rooms absolutely prevail (62 farms out of 87). Only 8 farms in the test group had 5 rooms for rent, 14 farms offered 4 rooms as accommodation and 3 farms had 1 room for guests. A similar trend in the organizing of accommodation was observed in the north-east region of Mazovian Region [Ciepiela et al. 2007] and farmhouses situated in the valley of the Bug [Balińska and Sikorska-Wolak 2001].

Table 1. The volume of rural-touristic accommodation in farms in Siedlce region (means from years 2006–2007)
Tabela 1. Wielkość agroturystycznej bazy noclegowej w gospodarstwach regionu siedleckiego (średnia z lat 2006–2007)

County	Number of farms	Number of bedrooms	Number of beds
sokołowski	12	42	108
siedlecki	15	48	121
węgrowski	25	67	159
łosicki	19	55	150
miński	9	23	65
garwoliński	7	23	69
Total:	87	258	673

Source: Authors' research.
Źródło: Badania własne.

In the above mentioned agritourist farms 3-and 2-bed rooms were predominant and added up to 233 rooms, which is 90% of total accommodation. Occasionally, 4- and 1-bed rooms could be found (Figure 4). In a similar way was adjusted the accommodation on farms located in the district of Białowieża, where the 27 surveyed households offered primarily 2- and 3-bed rooms, which, respectively, constitutes 67% and 22% of the total accommodation [Kur-Kowalska and Ciepiela 2007].

In the surveyed accommodation facilities, apartments with one shared bathroom for guests prevailed in number. Therefore, it can be assumed that in Siedlce Region, most often tourists came across accommodation of one bathroom for several guest rooms. It

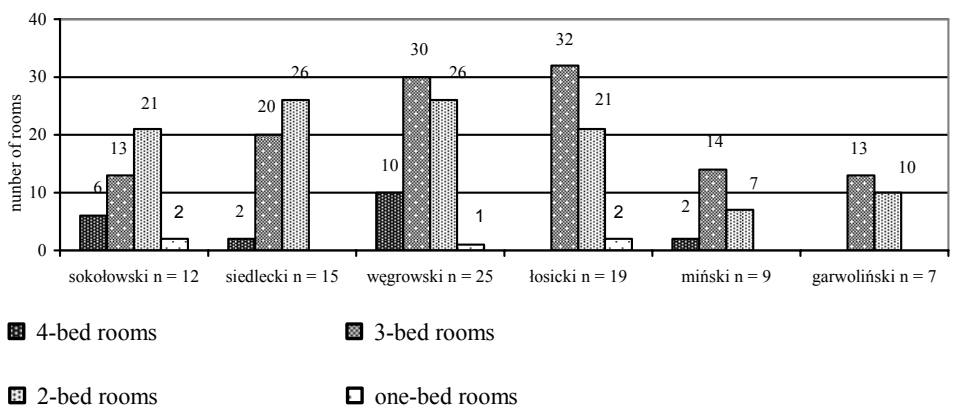

Fig. 4. Accommodation volume in touristic farms in various counties in Siedlce region (means from years 2006–2007)
Rys. 4. Baza noclegowa w gospodarstwach agroturystycznych poszczególnych powiatów regionu siedleckiego (średnia z lat 2006–2007)
Source: Authors' research.
Źródło: Badania własne.

should be noted that the sanitary facilities differed depending on particular districts of the region. The highest standard of accommodation was offered in Łosice District, where 33 out of 55 rented rooms were with an en suite bathroom. On the other hand, in Siedlce, Garwolin and Węgrów Districts, rooms with en suite bathrooms accounted for more than 40% of the share.

PROFITABILITY OF AGRITOURIST ACTIVITIES

An economic analysis of agro-tourism plays a large role. It allows to determine what financial result is brought by tourist activities, and where the main motivation is the desire to obtain additional income on the farm. A financial analysis of this activity involves a number of issues and is a complex tool that requires advanced accounting. Agritourist farms do not usually keep such advanced accounts. For that reason, the conducted study was limited to calculate direct costs and revenues connected with the catering and maintenance of tourists staying in the test farms in 2006 and 2007. The direct surplus of each farm was calculated directly on the basis of the above mentioned economic values.

Data presented in Table 2 shows that the average price of board for a tourist staying at agritourist farms located in various districts of Siedlce Region was varied and ranged in price from 23.58 PLN (Węgrów District) to 37.25 PLN (Mińsk District). It is also noteworthy that accommodation prices diverged markedly. The average price of accommodation in the farms of Węgrów District was 21.41 PLN on average, while in Mińsk District one usually had to pay 35.12 PLN per night.

The differentiation also concerned the number of sold services. Analyzing the average number of services sold per one farm in particular districts, it should be noted that Mińsk District took first place (185.03). The second was Garwolin District (178.31), and right behind it, Sokołów District (1730.8). The smallest number of tourist services was rendered by farms in Węgrów (123.07 on average) and Siedlce District (159 on average).

The annual direct cost of tourists' stay in individual farms was made up by the number of sold service units and the daily cost of meals and the maintenance of the tourist. The value of these costs per average household varies depending on the district, from 2094.52 PLN (Węgrów District) to 3056.63 PLN (Łosice District). The higher direct costs in Łosice District, compared to the district of Mińsk, Garwolin and Sokołów, where the number of services was higher, result from higher costs of heating a large surface of accommodation, administered by some owners of farms in Łosice District. The higher direct costs also result from higher expenditures on advertising and promotion of tourist services.

The total direct revenue, calculated as the product of the number of services sold in different agro-tourist farms and the prices of these services, was not always higher in those districts, where the average number of services was higher. The average monthly revenue per household in Siedlce District (10,245.38 PLN) was higher than in Garwolin Łosice and Sokołów Districts, despite the lower number of sold service units. This state of affairs was dictated by a much higher service price in holdings in Siedlce District in comparison to the above mentioned districts. Noteworthy is the fact that Mińsk District took first place in the ranking of income counted on the basis of supply against demand (Table 3), with an income of 206 PLN per available bed and with an income of 72 PLN per sold bed (average price). This proves a fairly good estimate of the size of provided

Table 2. Economic indicators of touristic activities in the region of Siedlce (means from farms and years 2006–2007)

Tabela 2. Parametry ekonomiczne działalności agroturystycznej w regionie siedleckim (średnia z gospodarstw i lat 2006–2007)

Specification		County						Mean for the region
		sokołowski	siedlecki	węgrowski	łosicki	miński	garwoliński	
Direct cost of services [PLN]	Catering	1064.45	978.18	667.58	1148.82	1137.93	1096.62	1015.59
	Accommodation	1947.88	1875.76	1426.94	1941.06	1830.86	1773.32	1799.20
The direct cost of the tourist visit [PLN]		3012.34	2853.94	2094.52	3056.63	2968.80	2869.94	2809.36
Price of service [PLN]	Catering	32.40	35.72	23.58	31.83	37.25	27.50	31.38
	Accommodation	24.60	28.77	21.41	28.16	35.12	27.50	27.58
Number of units sold [pc]		173.08	159.00	123.07	166.30	185.03	178.31	164.13
Direct revenue [PLN]	Catering	5576.12	5699.80	2906.36	5319.50	6922.80	4861.06	5214.27
	Accommodation	4300.01	4557.18	2631.90	4660.50	6490.92	4921.12	4593.60
Total direct income [PLN]		9876.13	10245.38	5538.30	9980.00	13413.72	9782.18	9807.87
Direct surplus [PLN]	Catering	4511.66	4723.83	2238.77	4203.93	5784.96	3744.44	4198.68
	Accommodation	2352.12	2681.42	1204.94	2719.44	4659.97	3147.80	2794.40
Total Direct surplus [PLN]		6865.29	7404.94	3442.77	6923.37	10444.93	6912.24	6993.08

Source: Authors' research.
Źródło: Badania własne.

Table 3. Analysis of income from touristic activities in the examined farms compared with the supply and demand

Tabela 3. Analiza przychodu z działalności agroturystycznej w badanych gospodarstwach na tle popytu i podaży

Analysis of income compared with the supply			Analysis of income compared with the demand		
Rating	County	Yield [PLN]	Rating	County	POR [PLN]
1	miński	206	1	miński	72
2	garwoliński	141	2	siedlecki	64
3	sokołowski	91	3	łosicki	60
4	siedlecki	84	4	sokołowski	57
5	łosicki	66	5	garwoliński	54
6	węgrowski	34	6	węgrowski	45
Region		14	Region		59

Source: Authors' research.
Źródło: Badania własne.

agrotourist service in relation to the existing demand in the market (the proper size of accommodation corresponding to natural attractiveness of the area). On the other hand, Węgrów District is an example of a market, where there was a significant overestimate of accommodation facilities in relation to the demand. Hence the revenue per available bed (34 PLN) was lower than the value of income attributable to one sold bed (45 PLN).

A reliable financial result of agritourist activities is the direct surplus, calculated as the difference between revenues and direct costs. Analysing the value of this surplus, one can observe significant differences (Table 2). Farmers from Mińsk District earned the most (10,444.93 PLN), while in Węgrów the least (3442.77 PLN). The average direct surplus of 6993.08 PLN was obtained in the region of Siedlce in 2006–2007.

The value of direct surplus from tourist services offered by the surveyed households, by far, depended on the number of services sold and their prices. In turn, the demand for tourist services presented as an indicator of the average number of overnight stays during the year was also dependent, as indicated by the statistical analysis, on the attractiveness of the natural terrain. Indeed, a positive correlation of these features (Figure 5), largely determined the relationship between the value of the direct surplus and the value of rural recreational space

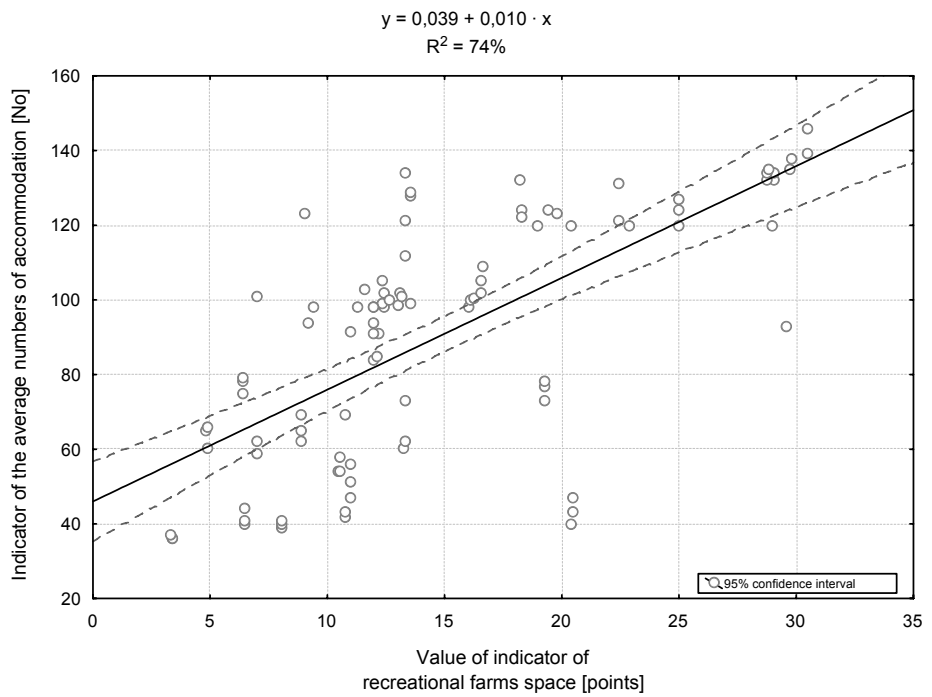

Fig. 5. The indicator of the average number of sold accommodation in the touristic farms in the region of Siedlce (per year) depending on the values of rural recreational space

Rys. 5. Wskaźnik przeciętnej liczby udzielonych noclegów w gospodarstwach agroturystycznych regionu siedleckiego (w ciągu roku) w zależności od wartości wskaźnika wiejskiej przestrzeni rekreacyjnej

Source: Authors' research.

Źródło: Badania własne.

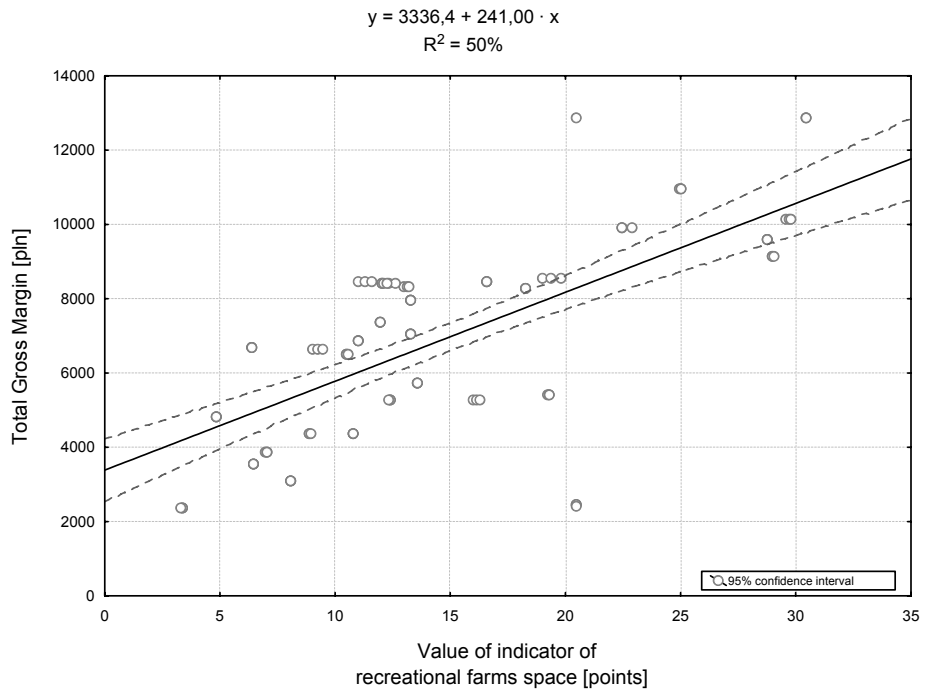

Fig. 6. The value of total direct surplus in touristic farms in the region of Siedlce, depending on the values of rural recreational space
Rys. 6. Wartość nadwyżki bezpośredniej ogółem w gospodarstwach agroturystycznych regionu siedleckiego w zależności od wartości wskaźnika wiejskiej przestrzeni rekreacyjnej
Source: Authors' research.
Źródło: Badania własne.

ratio. Furthermore, as depicted in Figure 6, the regression function indicates that the natural values significantly affect the amount of direct surplus from tourist activities received by farmers. The dependence of these traits was positively correlated. The value of the correlation coefficient was r = 0.71, which also means that the amount of surplus was in 50% (R^2 = 50%) determined by the value of the rural recreational space ratio.

CONCLUSIONS

Based on the research, the following conclusions were drawn:

1. Agrotourism in Siedlce Region was run mainly by people aged between 40 and 50, predominantly with secondary education.
2. The area of surveyed tourist farms averaged 7.07 ha, and the largest share (46.3% on average) were the farms with the area from 5 to 7.5 ha.
3. The total number of lodgings in 87 agro-tourist farms in Siedlce Region in 2006–2007 amounted to 673 beds. These beds were located in 256 rooms, mostly 2- and 3-bed rooms. The best living conditions were on the farms in Łosice District, where 60% of the rooms had an en suite bathroom.

4. The annual direct surplus as a reliable financial result from agritourism ranged from 2,383.1 to 12,878.96 zł and its value was significantly correlated with the ratio of rural recreational space attractiveness. The value of this surplus depended largely on the price of services. The highest average direct surplus was gained by farm owners of Mińsk District. However, Węgrów District farmers earned the least.

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ANALIZA WYNIKU FINANSOWEGO Z DZIAŁALNOŚCI AGROTURYSTYCZNEJ GOSPODARSTW ROLNYCH REGIONU SIEDLECKIEGO

Streszczenie. W celu oszacowania wyniku finansowego z działalności agroturystycznej w 2006 i 2007 roku przebadano 87 gospodarstwach rolnych świadczących usługi turystyczne na terenie regionu siedleckiego. Do właścicieli skierowano ankietę zawierającą 27 pytań, dotyczących rozmiarów bazy noclegowej i aspektów ekonomicznych działalności turystycznej. Uzyskane dane opracowano graficznie i tabelarycznie, a także wykorzystano je do obliczenia następujących wskaźników i wielkości ekonomicznych: wskaźnik wiejskiej przestrzeni rekreacyjnej, wskaźnik przeciętnej liczby udzielonych noclegów oraz wskaźniki analizujące przychód na tle popytu (POR) i podaży (Yield). Obliczono także wartość kosztów bezpośrednich, przychodów i nadwyżkę bezpośrednią. Dokonano również analizy statystycznej, wyliczając współczynnik korelacji Pearsona (r) i współczynnik determinacji (R^2). Przeprowadzone badania wykazały, że w gospodarstwach agroturystycznych regionu siedleckiego w 256 pokojach, najczęściej 2- i 3-osobowych, znajdowały się 673 miejsca noclegowe. Średnia roczna nadwyżka bezpośrednia z działalności turystycznej kształtowała się w przedziale od 2383,1 zł do 12878,96 zł i jej wartość była istotnie skorelowana ze wskaźnikiem atrakcyjności wiejskiej przestrzeni rekreacyjnej.

Słowa kluczowe: region siedlecki, agroturystyka, nadwyżka bezpośrednia, baza noclegowa

Accepted for print – Zaakceptowano do druku 15.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 109–118*

TOURISM FUNCTION OF MAZOVIA VOIVODSHIP

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Abstract. The aim of this paper is to provide an overview over theoretical background of tourism function issue and to analyze its spatial composition in the counties of Mazovia region. Firstly, the author discusses the theory of tourism function and indicates some barriers involving its measurement. Secondly, tourism function has been analyzed by using partial indexes referring to tourism movement, tourism features and tourism values in the researched counties. Then, synthetic tourism function index has been calculated and analyzed and finally, the relation between tourism intensity and natural and anthropological resources have been researched.

Key words: tourism, tourism function index

INTRODUCTION

Tourism is a phenomenon which can not be closed in the administrative units. Tourist space is necessary connected with natural values and tourism infrastructure, what usually do not coincides with administrative borders. Therefore, the concept of tourism function included in administrative unit is somewhat artificial. However, in order to research tourism intensity, tourism function or other tourism issues, there is a need for statistical conceptualization, which allows illustrating its spatial differentiation on the national or regional level. For the need of the research analyzed in this paper, the tourism function has been researched on the level of counties of Mazovia region (one of the 16 voivodships in Poland).

The aim of the paper is to provide an overview over theoretical background of tourism function and to analyze its spatial distribution in Mazovia region. The data on tourists and accommodation, which have been used for the analyses, have been taken from the category "Tourism" → "multiply accommodation objects" of Main Statistical Office (GUS) local date base. Tourist service has been phrased in the amount of enterprises in section I – Accommodation and Gastronomic Activities (according to Statistical Classification of

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Products by Activity in the European Economic Community, 2008 version). The needed data derives from the category "Economic entities" of GUS Local Date Base. Data referring natural and anthropological values were taken form the category "Environmental Protection" and "Forestry" of GUS Lokal Data Base as well as form the data base of The National Heritage Board of Poland. All data come from the year 2009.

TOURISM FUNCTION THEORY

In the literature two approaches to the tourism function issue can be distinguished. The first one is the classical approach (narrow one), which refers to economic meaning of tourism function. Warszyńska and Jackowski [1979] describe areas with tourism function as territorial units in which tourism plays a dominating role in its economy. The same as areas with industrial or agricultural function, there are areas with significant tourism function, which can be described as tourist regions [Derek 2008]. Matczak [1989] or Kurek and Mika [2007] express tourism function as socio-economic activity of an area which is directed into tourism services. Another example is an approach proposed by Baretje and Defert [1972] that claim that areas with tourism function can be considered as territorial units where employment in tourism business constitutes more then 50% of the total employment [Cooper 2009]. However, such a approach is connected with difficulties concerning the measures. First of all, it is complicated to separate employment in trade and services directed only to tourists from the one directed to the residents. Secondly, the precise statistical data in this aspect are very limited. Though, oversimplifying this concept in polish conditions, the tourism function can be evaluate by comparing the employment in section I – Accommodation and Food Service (according to PKD classification) to the total employment in the researched area. More applicable is approach proposed by Defert [1967] which refers tourism function to number of beds per capita. Some authors take into account also the numbers of tourists according to the number of residents or an area [Derek 2008].

The second approach to the tourism function theory is new (broad) one, which assumes that evaluation of tourism function of an area has to be more complex. Except of socio-economic aspect, the others factors like tourism infrastructure, tourism movement or tourism values are relevant. This approach reflects fully the character of tourism function issue. Derek [2008] underlines the fact that tourism function is developed only when each of three factors are highlighted, what illustrates Figure 1.

Fischbach [1989] claims, that by evaluating tourism function of an area even more aspects has to be considered and names seven groups of factors: tourism values, tourism infrastructure, communication availability, tourism movement (scale and structure), land use, incomes coming from tourism sector, and employment (scale and structure).

Summing up, it can be ascertain that the area with fully developed tourism function is an area distinguished by tourism values and infrastructure and reflecting relative high tourism movement.

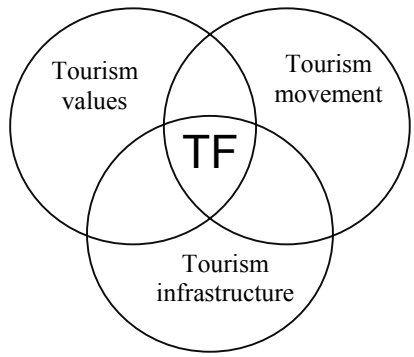

Fig. 1. Tourism function
Rys. 1. Funkcja turystyczna
Source: Derek [2008].
Źródło: Derek [2008].

TOURISM FUNCTION INDEXES

The most popular way to measure spatial variation of tourism function is to examine the distribution of accommodation and the scale of tourism movement. Examining the distribution of accommodation capacity according to population or an area is not only because hotels and another related establishments are highly visible on the landscape but also because countries are more likely to collect statistical data on it than any other element of tourism supply [Pearce 1996]. However, although tourism accommodation and movement gives a useful indication of where tourism plays a significant role, absolute value do not necessarily reflect the importance of tourism within a region. The big urban centers may have a greater number of accommodation units and tourist visits than small towns or some peripheral areas, which in absolute terms would mean that tourist function of the large cities, is higher than of other areas but in reality it may not be so. Big cities may perform other urban functions which are more dominant than its tourism function. On the other hand, peripheral areas or small cities may be more dependants on tourism and may perform significant tourist functions. Therefore, the absolute values on accommodation and tourist visits are sometimes misleading and can give a wrong visual impression of the importance of tourism in a region.

In order to evaluate the relative importance of tourism in territorial units, the use of accommodation data is a logical one because the stay away from ones normal place of residence is one of the defining characteristics of tourism. To demonstrate different ways of analyzing and visualizing the spatial aspects of tourism at the various Nomenclature Units for Territorial Statistics (NUTS) levels some indexes were developed. Among the several methods proposed by researchers to measure the relative importance of tourism, the one that is the most popular is Defert's tourist function index (TFI). Defert [1966] in-

troduced TFI which is derived by comparing the number of bed available to tourists with resident population of the researched area. In this case tourist density is measured.

The Tourism Function Index is calculated:

$$TFI = (N \cdot 100)/P$$

where: N = number of bed spaces and P is the population.

However, Boniface and Cooper [2009] pay attention to the fact that Defert's tourism function index works good as a measure for holiday resorts but it underestimates the impact of tourism in cities with a large resident population, or in historic towns that attract large numbers of day visitors [Cooper 2009]. Also, it is important to underline that while TFI used to compare variations in accommodation density between regions within the same country is very meaningful, at the international level, though, can be misleading because of the differences in definitions and registration requirements among the countries.

Tourism function can be also measured by searching tourism intensity expressed by the quotient of the number of tourists to the local population (Scheider's index) or, proposed by Defert, to an area in km^2 (Defert's index). Another approach described in the literature is Charvat's index which examines the amount of beds according to an area. Coccossinis and Parparis [2000] describes some indexes which are less used namely: tourist comfort index based on a formula which distinguishes the quality between different types of accommodation using certain criteria, the concentration index which is an attempt to determine the degree of concentration of tourist activity as well as the attractiveness index, derived by comparing the number of bed nights between international and domestic tourists. Attractiveness index can be used in order to evaluate a region's profile in attracting specific types of tourism overall or by category.

For the purpose of evaluating spatial diversification of tourism function in Mazovia region the complex approach has been used. The tourism function has been researched in three aspects: tourism features, tourism movement and tourism values.

Two variables have been specified in order to evaluate tourist movement in the researched region, namely number of guests staying overnight per 100 inhabitants (Schneider's index) and number of guests per km^2 (Defert's index).

Variables examining tourism features have been divided in two groups: beds and tourism services. The amount of beds is referred to an area in km^2 (Charvat's index) and to 100 inhabitants (TFI) Tourist services are phrased in the amount of enterprises in section I and in the share of this objects in the total number of enterprises in the county.

While examining tourism features of some area, it is important to take into account environmental factors, which give physical and mental relaxation of tourists and anthropogenic ones, such as monuments of history, cultural heritage, collections of art but also sports centers, events, etc. However, while in case of towns cultural heritage, collections of art, sports centers, events are the most important, in peripheral areas environmental factors attracts tourists the most. Because of limited statistical data the natural values in this paper have been specified by percentage of an area protected by law and percentage of forests in the county. Anthropogenic values have been described by number of sites registered as historic monuments per area unit. The Table 1 shows the schema of variables used for the purpose of research.

Table 1. Variables for tourism function evaluation
Tabela 1. Zmienne tworzące wskaźnik poziomu rozwoju funkcji turystycznej

Specification		Variable	Data source
Tourist movement	Guests	Number of guests staying overnight/100 inhabitants	GUS
		Number of guests staying overnight/km^2	
Tourism features	Beds	Number of beds/km^2	GUS
		Number of beds/all inhabitants · 100	
	Tourist services in the county	Number of companies registered in section I	
		Number of companies registered in section I/number of all companies	
Tourism values	Natural values	Percentage of area in the county protected by law	GUS
		Percentage of forests	
	Anthropogenic values	Number of sites registered as historic monuments per area unit	KOBiDZ

Source: Own elaboration based on Derek [2008].
Źródło: Opracowanie własne na podstawie Derek [2008].

RESULTS

The analyses of tourist movement and tourism features in the counties of Mazovia region delivered the following findings. Three counties shows Schneider's index higher than average for Poland namely Warsaw, Legionowski and Warsaw West poviat. Relative high index has also Pruszkowski poviat, whereas the lowest values show: Ostrołęcki (0), Zwoleński (0) and Lipski poviat. Looking at the number of tourists according to km^2 (Defert's index), the highest values, much above the national average, appear in the poviats: Warsaw, Siedlce, Radom, Ostrołęka, Pruszkowski, Płock, and Legionowski. These are mainly towns with big population or poviats situated near Warsaw. The lowest Defert's index appears again in the counties: Ostrołęcki (0), Zwoleński (0), Lipski and Żuromiński.

Analysing he number of beds per km^2 it can be observed that Warsaw, Siedlce, Radom, Ostrołęka, Płock, Legionowski and Pruszkowski have higher values then average, where Warsaw is definitely a leader. Generally, Defert's index is connected with relative high number of beds. However, sometimes poviats show insufficient use of existing accommodation units (e.g. Węgrowski). Meanwhile the highest rate of beds according to 100 inhabitants (TFI) has Łosicki and Legionowski poviat. The lowest values in this two, referring accommodation, groups can be observed in Ostrołęcki (0), Żuromiński (0), Przasnyski, Żyrardowski.

Examining the amount of tourism enterprises per 1000 inhabitants it can be observed that poviats: Warsaw, Legionowski, Warsaw West and Piaseczyński are in front ranks. However, taking into account the average for Poland, the share of these companies in the all enterprises in the poviat is not meaningful. It indicates the fact, that Mazovia shows low scale of tourism companies in compression to other polish regions. The lowest num-

bers of companies in section I show Ostrołęcki, Siedlecki, Węgrowski, and Żuromiński poviats. The above discussed results have been shown in the Table 2.

The analyses of natural and anthropological values of researched poviats have brought to the following conclusions (Table 3). The poviats with the highest % of forest are Wyszkowski, Szydłowiecki, Kozienicki, Legionowski, Ostrołęcki. The highest % share of protected areas show Otwocki, Legionowski, Żuromiński and Żyrardowski, while the lowest have Ostrołęka, Makowski, Ostrołęcki, and Wyszkowski poviat. Referring to the number of protected monuments per 100 km^2, the highest value reflect Warsaw, Radom, Płock, Siedlce.

Table 2. Tourism movement and features indexes for the poviats in Mazovia Voivodship
Tabela 2. Wskaźniki ruchu i zagospodarowania turystycznego dla powiatów województwa mazowieckiego

No.	Poviat	Tourist movement			Tourist features		
		Schneider's index	Defert's index	Charvat's index	TFI	Enterprises in section I/1000 inhabitants	Enterprises in section I/total enterprises
1	2	3	4	5	6	7	8
1	Białobrzeski	9.792	5.157	0.131	0.249	2.197	0.029
2	Ciechanowski	14.971	12.759	0.555	0.651	1.269	0.017
3	Garwoliński	13.355	11.119	0.666	0.8	1.084	0.017
4	Gostyniński	11.334	8.613	0.302	0.397	1.432	0.021
5	Grodziski	18.012	40.221	0.785	0.351	2.795	0.022
6	Grójecki	20.357	15.556	0.289	0.378	3.156	0.037
7	Kozienicki	11.120	7.444	0.461	0.689	1.906	0.029
8	Legionowski	96.109	246.521	4.452	1.736	3.780	0.027
9	Lipski	0.987	0.481	0.026	0.054	1.426	0.020
10	Łosicki	25.219	10.561	1.636	3.907	1.082	0.017
11	Makowski	2.637	1.149	0.067	0.155	1.530	0.020
12	Miński	13.313	16.440	0.551	0.446	1.794	0.024
13	Mławski	9.632	5.962	0.172	0.278	1.448	0.021
14	Nowodworski	15.1597	16.755	0.507	0.459	1.778	0.022
15	Ostrołęcki	0	0	0	0	0.994	0.020
16	Ostrowski	19.279	11.818	0.296	0.483	1.807	0.021
17	Otwocki	23.343	45.391	1.032	0.53	2.441	0.0231
18	Piaseczyński	26.559	67.309	1.803	0.711	3.449	0.021
19	Płocki	19.069	11.477	0.48	0.798	1.265	0.044
20	Płoński	13.317	8.429	0.125	0.197	1.427	0.023

Table 2 cont.
cd. tabeli 2

1	2	3	4	5	6	7	8
21	Powiat m. Ostrołęka	28.646	528.758	6.137	0.3323	3.437	0.022
22	Powiat m. Płock	20.093	285.702	6.881	0.4839	2.427	0.032
23	Powiat m. Radom	18.537	370.420	7.441	0.372	2.564	0.022
24	Powiat m. Siedlce	23.881	571.908	21.782	0.909	2.346	0.022
25	Powiat m.st. Warszawa	122.945	4080.881	44.3	1.334	4.532	0.023
26	Pruszkowski	44.143	269.315	3.99	0.654	3.580	0.022
27	Przasnyski	2.480	1.075	0.015	0.035	1.155	0.018
28	Przysuski	11.774	6.362	0.38	0.704	1.271	0.021
29	Pułtuski	28.031	17.245	0.324	0.527	2.196	0.0297
30	Radomski	8.582	8.258	0.318	0.33	1.127	0.017
31	Siedlecki	3.819	1.931	0.072	0.143	0.752	0.013
32	Sierpecki	5.835	3.662	0.252	0.401	1.008	0.0181
33	Sochaczewski	9.825	11.280	0.235	0.204	2.406	0.024
34	Sokołowski	2.310	1.145	0.068	0.137	1.069	0.0174
35	Szydłowiecki	28.337	25.180	0.506	0.569	1.294	0.019
36	Warszawski Zachodni	51.680	101.990	2.626	0.547	3.831	0.028
37	Węgrowski	13.140	7.226	1.339	0.678	0.879	0.014
38	Wołomiński	6.0632	13.519	0.387	0.705	2.793	0.025
39	Wyszkowski	20.657	17.041	0.553	0.248	1.701	0.021
40	Zwoleński	0	0	0.46	0.558	1.074	0.021
41	Żuromiński	1.358	0.679	0	0	0.943	0.015
42	Żyrardowski	17.219	24.379	0.009	0.019	2.625	0.024
43	Average for Poland	50.316	61.895	1.939	1.576	3.079	3.079

Source: Own elaboration based on the CSO Local Data Base (2009).
Źródło: Opracowanie własne na podstawie Bazy Danych Lokalnych GUS (2009).

Synthetic tourism function index has been calculated as the arithmetic mean of standardized all 9 variables, by mean = 100 and standard deviation = 15. The results show that poviats counties with the highest indexes are: Warsaw (146), Legionowski (115) Płock (111), Radom (108), Siedlce (108), Warszawski Zachodni (108), Ostrołęka (104), Łosicki (104) and the poviats with the lowest indexes are: Zwoleński (93), Lipski (93), Sierpecki (92), Siedlecki (90), Żuromiński (90).

Analyzing the correlation between synthetic index of tourism movement and features and tourism values it can be observed that they are only mildly related.

The natural values separately show even lower correlation, whereas the number of anthropological values is more related with tourism movement and infrastructure (Table 4).

Table 3. Tourism values in the poviats of Mazovia Voivodship
Tabela 3. Wskaźniki walorów turystycznych dla powiatów województwa mazowieckiego

No.	Poviat	% of forest	% of protected areas	Number of monuments/100 km^2
1	2	3	4	5
1	Białobrzeski	25.1	54.781	5.320
2	Ciechanowski	16	37.393	8.396
3	Garwoliński	29.7	36.770	4.280
4	Gostyniński	22.4	42.852	6.341
5	Grodziski	11.7	23.520	26.158
6	Grójecki	13.1	22.941	10.094
7	Kozienicki	30.2	11.414	4.803
8	Legionowski	30.1	72.131	9.743
9	Lipski	17.2	20.389	5.405
10	Łosicki	21.3	23.517	7.253
11	Makowski	25.2	0.966	3.286
12	Miński	21.1	29.813	7.474
13	Mławski	19.2	50.219	42.857
14	Nowodworski	26.1	61.030	6.474
15	Ostrołęcki	30.9	0.449	2.479
16	Ostrowski	27.9	1.059	5.747
17	Otwocki	29.8	78.108	9.902
18	Piaseczyński	18.1	52.474	25.281
19	Płocki	17.1	33.520	6.625
20	Płoński	13.4	35.563	6.884
21	Powiat m. Ostrołęka	8.7	0	89.655
22	Powiat m. Płock	4.8	22.677	187.5
23	Powiat m. Radom	6.4	2.254	172.321
24	Powiat m. Siedlce	6.6	13.433	96.875
25	Powiat m.st. Warszawa	14.3	23.259	251.450
26	Pruszkowski	10.7	34.874	23.577
27	Przasnyski	29.3	3.222	4.265
28	Przysuski	30.7	40.160	4.619
29	Pułtuski	18.9	16.853	7.980
30	Radomski	25	21.619	6.209
31	Siedlecki	18.3	24.466	4.678
32	Sierpecki	13.5	49.978	6.690
33	Sochaczewski	14.7	34.4874	11.292
34	Sokołowski	23.4	40.928	4.332

Table 3 cont.
cd. tabeli 3

1	2	3	4	5
35	Szydłowiecki	31.8	39.014	5.752
36	Warszawski Zachodni	25.1	46.892	10.299
37	Węgrowski	27	38.036	5.173
38	Wołomiński	29.3	20.901	5.136
39	Wyszkowski	33	0.095	5.365
40	Zwoleński	14.9	11.054	5.061
41	Żuromińskiski	20.4	74.079	2.973
42	Żyrardowski	22.6	60.758	42.401
43	Avarage for Poland	29	32.31	20.251

Source: Own elaboration on the base of the CSO Local Data Base and The National Heritage Board data base.
Źródło: Opracowanie własne na podstawie Bazy Danych Lokalnych GUS i bazy danych Narodowego Instytutu Dziedzictwa.

Table 4. Correlation between tourism function indexes
Tabela 4. Korelacja między wskaźnikami funkcji turystycznej

	Tourism movement, features <-> tourism values (natural and anthropological)	Tourism movement, features <-> natural tourism values	Tourism movement, features <-> anthropological tourism values
Pearson's coefficient	0.637	0.432	0.657

Source: Author's elaboration.
Źródło: Opracowanie własne.

CONCLUSIONS

The following conclusions may be drawn from this research:

- Spatial composition of tourism function in Mazovia region is much differentiated. There are high disparities between development of tourism in Warsaw agglomeration, towns and peripheral areas.
- Despite of valuable natural resources peripheral poviats are very backward referring to tourism development and show insufficient use of existing accommodation.
- Tourism function in Warsaw agglomeration and towns shows correlation with anthropological advantages, while natural values do not relevantly affect the level of tourism function.
- Mazovia region shows low scale of tourism companies in compression to other polish regions.
- The research of tourism function issue is limited because of not sufficient availability of certain statistical data.

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FUNKCJA TURYSTYCZNA WOJEWÓDZTWA MAZOWIECKIEGO

Streszczenie. Celem artykułu jest przedstawienie oraz próba analizy przestrzennego zróżnicowania funkcji turystycznej w powiatach województwa mazowieckiego. W celu określenia funkcji turystycznej obliczono i zbadano wskaźniki cząstkowe odnoszące się do ruchu turystycznego, zagospodarowania turystycznego oraz naturalnych i antropogenicznych walorów turystycznych. W dalszej kolejności na podstawie skonstruowanego wskaźnika syntetycznego zbadano zależność między ruchem turystycznym a walorami turystycznymi.

Słowa kluczowe: turystyka, funkcja turystyczna

Accepted for print – Zaakceptowano do druku 22.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 119–137*

ECONOMIC SUSTAINABILITY OF AGRICULTURE – CONCEPTIONS AND INDICATORS

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Abstract. The article presents different concepts of sustainable agriculture. It aims to define an economic sustainability of agriculture and to discuss the possible ways of its assessment. It states criteria of measurement and parameters used by the OECD and the European Commission (EC). The method of system analysis has been applied to study simultaneously different issues of sustainability, i.e. economic, environmental, social and institutional. The very last aspect has been considered because of the role of governmental intervention in the sector. The conclusion is that the opportunity of gaining permanent income parity is, beyond all question, an indicator of an economic and social sustainability of agriculture in the national economy.

Key words: sustainable development, economic sustainability, sustainable agriculture, income parity, multifunctional agriculture

INTRODUCTION

The poverty line in developed countries means satisfying the basic needs of the poorest social strata while it is not equal to satisfying even the basic needs in the developing countries with low social income. Sustainable development is most often described as the need to maintain a permanent income for humankind, generated from non-declining capital stocks. Thus, constant stock of human, man-made, natural and social capital are considered as necessary and often sufficient criteria of sustainable development [Spangenberg 2005]. A question arises, to what degree the conception of sustainable development refers to the population of farmers. What is the range of the present parities or disparities in the farming economy? Do achieved economic conditions enable to implement the conception of sustainable development of rural areas by the subjects of farming economy or is the financing of agricultural development a matter of non-farming subjects of the national economy?

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Every society can be described as comprising of four dimensions, the economic, social, environmental and institutional. Each of them is a complex, dynamic, self-organising and evolving entity in its own right, making the coupled system one of tremendous complexity. For this system to be sustainable, each of the four subsystems has to maintain its capability to survive and evolve, while the interlinks of the subsystem must enable a permanent co-evolution [Spangenberg 2005]. This is the context in which the concept of sustainable development has taken root – i.e. that of linking the economic, social and environmental objectives of societies in a balanced way [OECD 2001]. The immense significance of institutional encirclement of agriculture does not allowed to neglect the institutional subsystem in the multi-dimensional evaluation of sustainability in agriculture [Wiśniewska 2009].

ASSESSMENT OF SUSTAINABLE DEVELOPMENT

The concept of sustainable development has already been defined in at least a few dozen times. Some researchers associate it with an identical rate of growth in all the sectors and regions of an economy, others link it with a strive at improving the quality of all people's lives. It is called the conception of eco-development by some other scientists. 'Sustainable development' means that the achieved progress results in the development of a contemporary generation, but at the same time, it creates a potential which is necessary to meet the needs of future generations [Pearce, Barbier, Markandya 2000]. It is, no doubt, a complicated, long-term process, considered in an infinite time horizon. The probability of sustainable growth appearing in economy is little. Sustainable development became the aspiration of the majority of world's economies in the 1990s. It is a key objective of the European Union which aims to continually improve the quality of life and well-being for present and future generations [European's... 2009].

Continuous and indefinitely (or at least long-term) sustained growth is – often implicitly – assumed to be a part of the concept of sustainable development of the economy by most authors. Under the standard assumptions of economic growth, the rate of growth is considered the only relevant parameter [Spangenberg 2005]. On the other hand, economic sustainability refers to the standard of living in the society and the distribution of income as well as the level of poverty while economic growth might be the subject of defining income inequalities within the society [Kuznets 1955]. Income and social inequalities are increasing simultaneously to the upper trend of economic growth, but the trend occurs only initially and then fell – the inverted – U that has become known as the Kuznets Curve [Stiglitz 2001]. A comprehensive studies and statistic reports show growing unequal income distribution and poverty in the OECD countries. According to the latest OECD report the gap between rich and poor has grown in more than three-quarters of the OECD countries over the past two decades [OECD 2008a].

Sustainability means putting into effect all the aspirations within the limitations of the present resources. A particular choice of one of a number of aims often requires maintaining the rest of the aimed values at minimum levels. All the aims may naturally oppose each other or even compete with each other. However, they can also be comparative or complementary, creating a closed unit. While considering the conception of sustainable economic development, a holistic approach is necessary with regard to each of its aspects. Synergetic "win-win-win-win" options can only be identified if all four dimen-

sions of sustainable development are taken into account. These dimensions, economic, environmental, social and institutional, involve complex synergies and trade-offs. The discussions showed that the emphasis should be on the interactions among these four dimensions in order to minimise possible conflicts [OECD 2000].

By examining a diverse set of indicators together, we can begin to understand the conditions and approaches that will support sustainable development. If we do a better job meeting today's needs, while also enhancing the assets and resources we ourselves inherited, we will be a step closer to designing a path of sustainable development [OECD 2000]. Thus far, the main sustainability assessment tools are economic (cost/benefit analysis, modelling, regressions, scenarios), environmental (life-cycle analysis, material flows, resource accounting, ecological footprint) and social (sustainable livelihoods, human and social capital measurement, participatory processes, distributions) (Table 1).

Table 1. Sustainable development: an experimental set of assessment tools of sustainability
Tabela 1. Rozwój zrównoważony: eksperymentalny zestaw narzędzi oceny zrównoważenia

Endowments	Economic	Environmental	Social
	• Capital Assets • Labour Productivity • National Debt to GDP Ratio	• Surface Water Quality • Endangered Ecosystems • Contaminants in Biota • Contaminated Land Area • Storage of Spent Nuclear Fuel • Cropland Converted to Other Uses • Status of Stratospheric Ozone	• Population • Children in Families with One Parent •Teacher Training Level
Driving Forces	Economic	Environmental	Social
	• Investment As a Percentage of GDP • Energy Use per Capita & GDP • Materials Use per Capita & GDP • Inflation • Investment in R&D per GDP	• Water Use to Renewal Ratio • Fisheries Utilisation • Invasive Exotic Species • Cropland Erosion Rates • Timber Growth/ Removals Balance • Greenhouse Gas Emission	• Contributing Time & Money to Charities • Births to Single Mothers • School Enrolment by Level • Participation in Arts & Recreation • People in Census Tracts with 40% or More Poverty
Current Outputs & Results	Economic	Environmental	Social
	• Domestic Product • Income Distribution • Consumption Expenditures per Capita • Unemployment • Home Ownership Rates • % Households in Problem Housing	• Metropolitan Air Nullity Nonattainment • Outdoor Recreational Ac tivities • Greenhouse Climate Re sponse Index	• Crime Rate • Life Expectancy • Educational Achievement Rates

Source: [OECD 2000].
Źródło: [OECD 2000].

Statistical analyses, based on average values, deform the real picture of where the existence of economic and social differences is obvious, to which degree it can be taken into account and considered in different aspects of economic policy and to which degree it constitutes a marginal phenomenon. Significant discrepancies appear among the subjects of economy and the attempt at comparing them results in a number of problems and difficult choices, being often virtually impossible. Strong comparability is based on existence of a single comparative measure like "utility" by which all actions can be ranked [Spangenberg 2005].

Although focussed on sustainability, this brings to a light, the fundamental discrepancies between the participants of sustainable development and of some of their common ground. There are defined a weak and strong comparability and commensurability of assessments in the above mentioned four dimensions: economic, environmental, social and institutional. A common unit of measurement of sustainability is not existing yet. Thereof, a wide set of indicators has been approved and developed recognised as a weak comparability and commensurability of some of the sustainable impacts.

To summarize, principally the sustainability criteria comprise incomparable and incommensurable economic, environmental, social and institutional qualities. The overall sustainability of the economy comprise all four dimensions. A common unit of measurement of sustainability has not been developed yet. In the recent studies and literature mostly economic measures of sustainability of social security systems, environmental protection, institutional potential and economic development have been considered.

CONCEPTION OF SUSTAINABLE AGRICULTURE

Although it represents nowadays only a small % of GDP in most of the countries all over the world, agriculture is very closely linked to the sustainable development. The sector uses environmental inputs such as land and water, and generates many outputs of environmental significance. As production intensity and output have increased, environmental policy issues have risen in importance across the world. Policy challenges facing post-industrial economies include reducing environmental impacts and risks from agriculture, responding to international environmental agreements which often touch on aspects of agriculture, and optimising agriculture's overall contribution to welfare [OECD 2000]. Progress in the farming sector is one of the conditions to be met in order to reach the defined aims of sustainable development. Due to its particular position connected with using natural resources on earth, it is the central point of the theory of sustainable development. Some definitions directly result from the principle saying that it is possible to derive from earth only as much as it is able to offer [Florczak 2008].

There is no generally accepted definition of sustainable agriculture. Conway and Barbier [1990] defined sustainable agriculture as the ability to maintain productivity, whether of a field, farm or nation, in the face of stress or shock (such as increasing salinity, or erosion, or debt, or a new pest, or a rare drought or a sudden massive increase in input prices). A case in point is the definition of the United Kingdom governmental Department of Environment Food and Rural Affairs (DEFRA) signifies several important attributes of sustainable agriculture: availability to the consumers of adequate supplies of wholesome,

varied and reasonably priced food, produced within accordance with generally accepted environmental and social standards, flexible and competitive industry which contributes to an economically viable rural society, effective protection of the environment and prudent use of natural resources, conserved and enhanced landscape, wildlife, cultural and archeological value of agricultural land and respecting of high level of animal welfare, contribute to the long-term sustainability of rural communities [DEFRA 2006].

The OECD definition of sustainable agriculture says that this is agricultural production that is economically viable and does not degrade the environment over the long run [OECD 2000a]. As detailed in a report by the Committee for Agriculture of the Food and Agriculture Organization of the United Nations (FAO) changes in perception in relation to the interpretation of Sustainable Agriculture and Rural Development (SARD) are emerging: "The first is that the concept must extend to social, institutional and economic sustainability and not exclusively environmental sustainability – the conservation and rational utilization of natural resources. Those now working on SARD understand that sustainability means that management practices must be profitable and socially and culturally suitable, and must satisfy local requirements such as property rights over natural resources. The second is a new focus on development as a process which must allow for calculated trade-offs between reductions in the stock of natural capital (forests, unexploited freshwater, etc.) and the generation of resources for investment in human and social capital (healthier and better educated people, technical knowledge and infrastructure). These shifts in perception increase the challenge of implementing SARD, but also open up opportunities for doing so" [The Place… 2001].

In the United States the term 'sustainable agriculture' was defined in 1977 year as an integrated system of plant and animal production practices having a site-specific application that will, over the long-term satisfy human food and fiber needs, enhance environmental quality and the natural resource base upon which the agriculture economy depends, make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls, sustain the economic viability of farm operations and enhance the quality of life for farmers and society as a whole [National… 1977]. The United States Network of Sustainable Agriculture Research and Education (SARE) defines thus sustainable agriculture refers to an agricultural production and distribution system that achieves the integration of natural biological cycles and controls, protects and renews soil fertility and the natural resource base, optimizes the management and use of on-farm resources, reduces the use of non-renewable resources and purchased production inputs, provides an adequate and dependable farm income, promotes opportunity in family farming and farm communities, minimizes adverse impacts on health, safety, wildlife, water quality and the environment [Food… 1990].

In the European Union (EU) interventionism in the farming sector has become a standard rather than an exception, which it is for non-farming sectors of economy. At the beginning of the 21st century, a number of questions have arisen, e.g. whether state interventionism was one of the causes of attenuating eco-development by resulting in an intensification of the farming economy in the former era. Will it presently enable to introduce social and political changes and will it determine farmers to implement the current targets of economic policy, not straining the budget? So far, the main aim of the

Common Agricultural Policy (CAP) has been to favour the economic development of agriculture which aimed to modernise European farming and thereby increase production to achieve European self-sufficiency in food production. This aim was supported by price supports and subsidies that also aimed to increase farm incomes relative to other areas of the economy and took place with little regard for the environment. It is doubtless that raising the efficiency creates an opportunity to preserve the social functions and the development of natural environment, while at the same time, it may result in their degradation and deterioration in capital stock and agricultural land capacity. It is difficult to oppose the thesis that an economic unit, being subject only to market forces and therefore only interested in profit maximisation, will not take into account the areas of its operation which do not favour its efficiency. Therefore, it is also difficult to oppose the view that a sustainable development requires a coordinated and comprehensive approach in planning and implementing economic policy, with the participation of the whole society [Wiśniewska 2010].

The Single European Act, which came into force in 1987, constituted a new legal basis for Community policy on the environment, and had the following objectives: to preserve, protect and improve the quality of the environment, to contribute towards protecting human health, to ensure a prudent and rational utilisation of natural resources The Act went on to state that: "environmental protection requirements shall be a component of the Community's other policies". The integration of common agricultural and environmental policy is an effect of McSharry's Reforms of CAP which was introduced in 1992 year. The impacts of agriculture and agricultural policies on the environment are a major concern in the EU countries, particularly in the context of agricultural policy reform and the achievement of sustainable agriculture. Agricultural policy reform policies to promote sustainable agriculture and address environmental and natural resource issues. The basic long-term challenge for agriculture is to produce food and industrial crops efficiently, profitably and safely, and to meet a growing world demand without degrading natural resources and the environment. While agricultural productivity has improved substantially, it has often been accompanied by resource degradation, such as soil erosion and water depletion. Agriculture also contributes positively to the environment through provision of landscapes, wildlife habitats, and as a sink for greenhouse gases [Łuczka-Bakuła 2007].

The conception of sustainable development in agriculture presented in the paper is, therefore, set on four (not three) dimensions, reflecting the impact of durable development of farming. Sustainability of agriculture can be defined as the state of four coinherent subsystems within which agriculture is operating. They are economic, social, environmental and institutional (Figure 1).

The subjective and objective scopes of the activities are implemented within the confines of state rural areas policy. They are targeted not only at farmers, but at the whole rural community and labour force, not merely farms, but also capital and natural resources, not just the income from farming, but also the income parity and the standards of living in farmers' families. There are different extents aimed by the sustainable policy linked as a feedback (Table 2). As it results from the above examples, all components of eco-development remain in mutual relations, creating a dynamic system. Thus, the policy of rural areas development requires continual discussion and making difficult decisions, often in

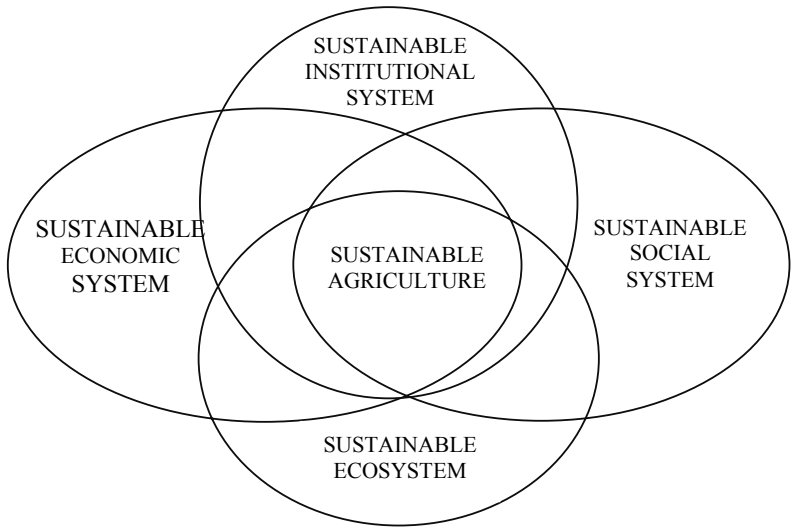

Fig. 1. The sustainable agriculture within co-inherent subsystems
Rys. 1. Zrównoważone rolnictwo w przenikających się subsystemach
Source: Authoress' own compilation.
Źródło: Opracowanie własne.

Table 2. The scope, subject, object and aim of sustainable development in agriculture in the economic, social, environmental and institutional dimension
Tabela 2. Zakres, przedmiot, podmiot i cel zrównoważonego rozwoju w rolnictwie w ekonomicznym, społecznym, ekologicznym i instytucjonalnym wymiarze

Scope	Subject	Object	Aim
Economic	Farm	Efficiency Level	Economic Equilibrium
Social	Rural Community	Level of Justice	Social Welfare
Environmental	Eco-System	Condition of Natural Environment	Environmental Equilibrium
Institutional	Institutional System	Competence Level	Institutional Development

Source: Authoress' own compilation on the basis of: [Indicators… 2000].
Źródło: Opracowanie własne na podstawie: [Indicators… 2000].

circumstances which oppose each other. Defining standards, minimal and maximal limits, and the way of measuring and monitoring the achieved effects becomes a condition to be met in terms of efficient policy. The costs and the subjects bearing them constitute primary concerns. General criteria of durable growth in agriculture should reflect both economic criteria, defined by economic efficiency, social, defined by the achieved level of equality, environmental, signifying improvement of the natural environment and institutional – improvement of institutions (Table 3).

The conception of sustainable agriculture includes the postulate of multifunctional development [Wilkin 2010]. The economic functions of agriculture include, among others, producing raw materials and food, intensification of production, structural

Table 3. An attempt to determine the main goals and results of sustainable agriculture in environmental, economic, social and institutional scope
Tabela 3. Próba określenia podstawowych celów i rezultatów zrównoważonego rolnictwa w wymiarze środowiskowego, ekonomicznego, społecznego i instytucjonalnego

Goal	Environmental	Economic	Social	Institutional
	• Quality of Natural Resources • Ecological Effecti veness • Ecological Innovati veness • Reduction of Ecosys tem Tensions • Reduction of Envi ronmental Degrada tion Effects on People's Lives	• Optimisation of Expenditure Use • Increase in Productivity • Competitive Farming Sector • Economic Efficiency of Farms • Economic Efficiency of Ecological Farms	• Optimal Inter--Generational Alloca tion of Resources • Ensuring Supplies Necessary to Ensure Food Safety of The Population • Ensuring Jobs • The Degree of Satis fying Needs	• Optimal Allocation of Public Goods & Services • Low Transaction Costs • Development of Eco nomic Infrastructure • Effectiveness of Managing Natural Environment • Internalisation of External Costs;
Result	Environmental	Economic	Social	Institutional
	• Implementing Eco--Development Programmes • Participation in Eco logical Initiatives • The Division of Profits & Losses From Ecological Initiatives • Creativity of The Private Sector;	• Maximising Aggregated Wealth • Effective Distribution of Income • Perfect Competition • Just Division of Profits & Losses • Human Capital Development	• Distribution of Incomes • Living Standard of Farmers • Percentage of Popu lation Under Poverty Line • Equal Opportunities for Farmers & Non-Farmers • Unemployment Rate • Demographic Deve lopment • Access to Education	• Development of Social Infrastructure • Universality & Institutional Transparency • Common Access To Public Goods & Services • Access to Information • Efficient System of Intervention • International Cooperation

Source: Authoress' own compilation on the basis of: [A Framework… 2001, Directions... 1999].
Źródło: Opracowanie własne na podstawie: [A Framework… 2001, Directions... 1999].

adaptation, technical and technological progress, efficiency and effectiveness of production and sales, price competitiveness, high quality of products and services, high income, developmental investments and R&D inputs. The environmental functions of sustainable agriculture include: protecting earth's natural resources, protecting the sanitary conditions of food articles, protecting and developing natural environment, including water, soil and air [Directions... 1999]. Important sustainability areas have been defined as regards agriculture, i.e. economic, social and environmental areas, with regard to which the level of economic effectiveness and social justice have been defined as sustainability measures. Basically, the conception of sustainability concerns such categories as: preserving and protecting resources, the effectiveness of transformation processes and intergenerational equilibrium [A framework... 2001]. The social functions agriculture include being a source of households' incomes, a place for professional activity, cultural development and cultivation of national tradition, leisure and recreation, promotion of tourism and healthy lifestyle and ensuring food safety. As well as in the overall sustainable economy, it is impossible not to consider

the institutional approach in the contemporary notion of sustainable agriculture either [Zegar 2005].

To sum up, the conception of sustainable agriculture marks a multi-layer range of growth, taking into account economic, social, ecological and institutional aspects. The aims of sustainable development in national economy are marked by three areas of interaction: social welfare, social justice and respect for natural environment. In order to implement the rules of sustainable development, farms, like non-farming enterprises, cannot solely act basing on the profit criterion, but they also have to take into account ecological criteria and, first of all, social criteria. The contemporary policies of sustainable development of rural areas are determined according to the conception of sustainable agriculture. Therefore, a question arises how to measure the effects of the implemented activities aimed at an integral development of rural areas, especially those immeasurable ones and unquantifiable ones.

ECONOMIC SUSTAINABILITY OF AGRICULTURE

In the macroeconomic debate, a few economic sustainability criteria are mentioned, like: rate of growth of production and income, effectiveness, efficiency, innovativeness, competitiveness, public debt. While criteria like inflation, unemployment rate, trade imbalances are politically prominent, but hardly ever located in sustainability context. Other, traditional criteria like aggregated demand, consumption levels and savings rates play a minor role in the current debate. So whereas there are ideas to be found in the economics literature regarding the environmental, social and sometimes institutional sustainability of the economic system, there is hardly any information available on the economic sustainability of the economy (and thus not on the overall sustainability of the economy, which comprises all four components). Even less so, criteria of economic sustainability have been developed for the other dimensions [Spangenberg 2005].

The parameterisation of sustainable agriculture achievements is considerably more difficult than that of conventional agriculture, as the latter generally aims at intensification and the basic economic criterion allows to quantify the effects with regard to a given value, i.e. efficiency, profit or profitability and to provide their absolute magnitudes [Baum 2003]. Much recent work on measuring progress towards sustainable development has addressed specific issues, such as measuring climate change or the environmental and social impacts of particular sectors (e.g. agriculture, energy and transport). Measuring sustainable development at an aggregate level, however, requires a broad integration of indicators of economic, environmental, and social changes. One way to achieve this integration is to extend the traditional framework used for measuring economic activity – the National Accounts. Extensions of the National Accounts to the environmental area currently underway. These extensions are aimed at recording changes in environmental assets, and at highlighting environment-related transactions (e.g. pollution abatement and control expenditure). Extensions to the social area may also allow the linking of accounts measuring employment, human capital, and the distribution of household income and consumption among various socio-economic groups. Measuring natural and human capital requires both monetary and physical data. While work in these fields has progressed,

the application of a fully extended National Accounts framework remains a medium- to long-term objective. In the shorter term, complementary approaches to achieve such integration are required [OECD 2001].

These are grouped as resource indicators (measuring levels and changes in economic, environmental and social assets and outcome indicators (covering the quantity and quality of development across a broad range of perspectives, including income distribution, health and environmental quality). As a result of the works of the UN Commission on Sustainable Development, started at the beginning of the century, first synthetic indices of sustainability have been designed. They are currently being evaluated and tested. The process of their compilation has not been finished yet. The OECD and the Eurostat also participate in the research. The attempts at an empirical measurement of the durability of economic growth have shown that at present it is impossible to take into account all the aspects of sustainable development by means of just a single index. The majority of the suggested indices of social development or social poverty do not take into account the income differences and ranges, which simplifies the picture of the studied reality. On the one hand, they are transparent, but on the other hand they do not reflect the real structure and the distribution of economic growth effects [Indicators 2001]. Three broad groups of the OECD indicators are being developed:

- Several contextual indicators describing broader economic and social aspects of agriculture that have sustainability implications, such as land use trends, and education levels of producers.
- Another group considers management and use of natural resources, such as indicators of nutrient, pesticide and water use.
- A third group considers agricultural impacts on soil and water quality, land conservation, biodiversity, habitats, landscape and climate change [OECD 2001].

The OECD is developing agri-environmental indicators (AEIs) within the framework which addresses a set of questions related to the linkages between causes, effects and actions. What is causing environmental conditions in agriculture to change, such as, changes in farm chemical input use? What are the effects of agriculture on the environment, such as, the impacts on soil, water, air, and natural habitats? What actions are being taken to respond to the changes in the state of the environment, for example, by farmers, such as promoting sustainable agriculture by community based approaches [OECD 2001]? Among a few dozen of indices currently used in international and national statistics, there most often used include: average use of fertilisers, pollution emission from glasshouse appliances, concentration of pollution in water, ground and air, use level, the condition and quality of natural resources, the area of organic cultivation, the number of eco-farms, price margin of organic products, the expenditure of the state on the implementation of environmental programmes and the degree of production extensification.

Income is the basic category of effect in agriculture. It comprises environmental, economic, social and institutional impacts on agriculture. Therefore, a calculation of the degree of economic development is possible and it comprises all possible income aspects. The calculation of benefits is based on measuring the added value in the national economy, gross and net incomes, incomes earned by farms and incomes of farmers' families. The evaluation of sustainable development has a macroeconomic dimension, as it marks the place of agriculture in national economy, but also a microeconomic one,

defining the stages of sustainable development of a farm. In both attitudes, a number of indexes are required and certain ranges of values referring to the particular aims of sustainable development. They serve as a basis for building synthetic indexes of sustainability (Table 4).

On the other hand, the calculation of losses takes into account not only private costs, born by the producer and the consumer, but also social costs, environmental costs and

Table 4. Economic sustainability of agriculture: an experimental set of aggregated economic indicators
Tabela 4. Ekonomicznie zrównoważone rolnictwo: eksperymentalny zestaw zagregowanych wskaźników ekonomicznych

Balance of Resources	Environmental	Economic	Social	Institutional
	• Net Pro-Ecological Investment	• Net Agricultural Investment	• Net Social Investment	• Net Infrastructural Investment in Rural Areas
Effectiveness, Compe-titiveness & Efficiency	Environmental	Economic	Social	Institutional
	• Profitability of Ecological Production • Productivity of Labour, Land & Capital • Profitability of Sales of Ecological Products • Terms of Trade of Ecological Agricultural Products;	• Profitability of Agricultural Production • Profitability of Labour, Ground & Capital • Profitability of Sales • Terms of Trade of Agricultural Products	• Profitability of Farm; • Labour Efficiency • Structure of Income in Farmers' Families;	• Expenditure on Supporting Agricultural Production • Expenditure on Supporting Ecological Production • Expenditure on Supporting Price Surcharges
Division & Diversity of Incomes, Redistribution	Environmental	Economic	Social	Institutional
	• Share of Ecological Agriculture in GDP • Income From Farming per Person Employed in Ecological Farm • Share of Incomes from Farming in Total Incomes	• Agricultural GDP Per Capita • Share of Agriculture in GDP • Agricultural Income per Employed Person • Share of Incomes from Agriculture in Total Incomes	• Income Parity of Households • Off Farm Incomes; • Income Distribution • Poverty Line • Expenses on Consumption & Investments;	• Share of Public Support in Final Agricultural Production • Expenditure on Development of Economic & Social Infrastructure • Regional & Sectoral Public Expenditure

Source: Authoress' own compilation on the basis of: [Indicators… 2000 and Indicators… 2001].
Źródło: Opracowanie własne na podstawie: [Indicators… 2000 i Indicators… 2001].

institutional costs paid by the taxpayer. Not only does it include accounting costs, but also broadly understood economic costs, implicit and explicit. Farms create a structurally diversified group of economic subjects, locally determined by a given social and economic environment, directions of production, scale of resources, production specialisation of farms and other features grouping this sort of economic subjects [Income 1985]. Scientific analysis of incomes therefore requires a statistical description of the strength of the connection and the kind of relation between the factors determining the quantity of production and the level of incomes.

The issue of equality in economic sciences relates to the theory of income distribution. Economic policy differentiates between vertical equity and horizontal equity as the rules determining the tax policy. On the other hand, the pay policy may be subject to the rule of equal pay, which assumes that for doing any kind of job, the pay a person receives should be independent from the tender, race, sex or any other features of the person doing the job. The idea of justice is used with reference to the division in welfare economy. It means equality in the sense that everybody should receive what they deserve or the expectations shall remain unsatisfied. The issue of equality in economic sciences relates to the theory of income distribution. Economic policy differentiates between vertical equity and horizontal equity as the rules determining the tax policy [Black 2008].

As far as inequality of incomes are concerned, they can be understood as the differences between particular people, families, groups of people, regions or states. A high diversity of incomes preserves the diversified division of wealth in society. Income discrepancies between regions and countries result from different opportunities to earn and different capital resources. The problems of income disparity are connected with exploring the differences between economic subjects, including households. It is set in the context of social and economic research. In hitherto analyses, the most frequent comparisons included average incomes, defined for particular social and professional groups. The outcomes allow to draw conclusions with respect to average economic inequalities and social inequalities in households.

One of the directions of research on income discrepancies is measuring the distribution of income in a particular group of economic subjects creating national or international economy. Comparing absolute and relative changes in the level of incomes obtained in particular groups of economic subjects, e.g. in the arrangement of demographical features. The statistical analysis of profitability uses the measurements of variation in order to define their deviation from the average value and the measurements of asymmetry, in order to define the degree and direction of irregularity and the measurements of concentration, similarity and the diversity of structures [Sobczyk 2010].

The division of incomes shows how numerous the groups of subjects in particular income ranges are and the distribution of incomes shows the differences between the average and the lowest income level in a following group. The spatial diversity of incomes, in turn, requires a summary statistical analysis. The most frequently used statistical methods include: the Lorenz Curve, Florence Coefficient, Pearson Coefficient and Gini Coefficient as well as Sen Index. The profitability analysis often includes the research of their dynamic variation by means of defining the function of average periodical rate of changes and developmental tendencies or absolute changes, including both nominal and real changes, e.g. by comparing the parities of purchasing power.

The specificity of the income from farming consists in the fact that it constitutes earnings on the engaged production factors in the farming production, i.e. land, capital and farmers' labour, as well as it compensates organisational and managerial efforts and risk bonus in case of farmers. Another important function of the income from farming is serving consumption purposes of households and, simultaneously, serving production and investment processes of farms. The issue of incomes from farming needs to be considered basing on two categories of these incomes, i.e. incomes from farming and personal incomes. The first one is particularly important in the context of developmental needs of a farm, the latter – in the context of consumption needs of a family of farmers'. What is specific for a farm is that the two categories of incomes cannot be discriminated between a priori [Zegar 2005].

The character of a farm constitutes a problem in the statistics of incomes and in the implementation of comparative research concerning income discrepancies in the economy. The income of a farming household is included in the statistical research of household budgets. Disposable income can then serve as a measurement of a household income. At the same time, the income of a farming household is defined by the added value or the farming income. Comparative analyses require a proper description of the range of data being compared and their representativeness for the kept statements. The issue of representativeness of empirical data remains a considerable hindrance, impeding the research on profitability, as in the case of farms, the data is gathered for those farms which approach certain economic results and keep an accounts register.

To sum up, to evaluate the economic sustainability the issue of incomes can be examined with reference to a professional group or a social group. Sociological research deals with the problem in a broad sense of relations between the city and the countryside, and hence, rural areas become the area of comparison for urban areas. Such spatial range of research has been dealt with by different regional studies. One of the issues is the differentiation of municipal and rural households, resulting from the dissimilarity of income sources. Such research context enables to analyse the structure of income creation [Leszczyńska 2007]. In addition to income indicators the quantification of environmental effects remains of major importance. Similarly to the indices measuring the effectiveness, the indices measuring environmental efficiency also have to take into account regional differences appearing in the economy and in natural environmental conditions.

INCOME PARITY IN SUSTAINABLE AGRICULTURE

The inequality of the income distribution within agriculture may be as wide as that within non-agricultural sector but not wider [Kuznets 1955]. The sustainable agriculture in the sustainable economy is constituted by the income parity. An American encyclopaedia of social sciences explains the notion of 'parity' in the section devoted to agriculture, subsection 'income and pricing policy'. The entry mentions 'parity price'. The term is actually an attempt at defining an objective criterion of the policy of price support in agriculture. It is the price of agricultural products ensuring a purchasing power, concerning consumption and production products and services, equal to that of previous periods [Sills 1968]. The parity price is to ensure proper salary and living conditions to farmers

employed in agriculture and a return on the invested capital. Similarly, such understanding of the notion of parity has found its reflection in legal acts in the USA, Great Britain and Germany in the 1950s and 1960s. The definition of parity is broadly discussed in Polish economic and agricultural encyclopaedias. It is described in the section devoted to the profitability of agriculture. It appears as an explanation of the term 'income parity', as a situation of equal incomes of comparable farming and non-farming populations [Woś 1998]. Further encyclopaedias include the term 'income disparity' and explain it as the difference between the incomes per person employed in agriculture and the income per person employed in other, non-agricultural professions [Encyklopedia... 1984]. Parity in agriculture can be considered in a number of aspects. The very claim of a parity indicates that it is a given part of the national economy that is in question. The hitherto research most often includes studies of income disparity between agriculture and non-agricultural part of the economy (exogenous parities) and, less frequently, those concerning the differentiation of incomes in agriculture (endogenous parities).

The present state of knowledge and the scientific research have not succeeded in unifying the parity ratio methodologically, i.e. they have not defined the kinds of incomes to be taken into account in comparisons. Allowing for quantitative and qualitative aspects of the labour factor in agriculture and non-agricultural employment, creating a given character of the labour market is indispensable in comparative research. Defining the professional groups whose incomes are to be compared with farmers – either, as one group of economists suggests, workers – or the self-employed in non-farming industries, as others claim. Also, it needs to be clarified whether the incomes to be compared are to be incomes from all possible sources or from one kind of employment only. Comparing and studying incomes results in defining the level of social justice (income justice) and economic efficiency of production. Justice is associated with a low risk of poverty threat while efficiency is linked with a high motivation to work and efficiency.

The concept of disparity in farmers' incomes in relation to non-farming population is directly connected with the agrarian issue in economic policy. The agrarian issue is considered in the context of a rule of law and the political system, according to which all professional and social layers of the population are equal. The income policy thus assumes that the incomes in farming and outside farming should show the same rate of growth in incomes. The egalitarian tendencies connected with the rule of social justice together create certain expectations of farmers towards the state. There is an increasing pressure of the farming lobby on equalising the incomes not only by means of a proper economic policy, but also by means of a proper social policy [Idczak 2001].

The notions of parity and disparity are the two notions commonly used by economists to evaluate income levels. They function in economic sciences as normative terms describing the situation of some selected economic categories being equal or being different. At the same time, Polish economic dictionaries define the term 'parity' as the one which only concerns monetary values in monetary and currency systems and the purchasing power of money. International dictionaries define the notion of 'parity' similarly, not using the concepts of income parity or disparity. The causes of disparities in agriculture differ from the conditions of income division in non-agricultural parts of the national economy. Despite the common economic features, there are some special circumstances, typical for the agricultural economy, such as the inflexibility of demand

for agricultural products, the prolonged period of return on investment in agricultural production or natural conditions of agricultural production, connected with the ground factor. The differentiation of the notions of exogenous and endogenous disparity can be introduced on the basis of the differences between the phenomena in the national economy and in agriculture. Exogenous disparities will describe the relations between agriculture and the national economy while endogenous disparities will describe the differences within the agricultural sector, defined as differentiation or stratification of farms as regards the levels of incomes or other analysed categories, e.g. households' expenses. Exogenous and endogenous phenomena constitute certain implications for agriculture, the national economy and the society.

Gross national income is the basic indicator of the economic and social efficiency of an economy. The issues of national income are constantly studied in scientific research on the factors of economic growth and the social and economic development. They are also the subject of interests of political groups and parties concerned about the participation of state in the division of national income and willing to optimise the role of state in this area. The sociological dimension of the income issues is present in the research on the basic differences and similarities between different social systems and in research on the features of various areas with dominating conditions of a wider social system. Income categories are for example used in the comparative analysis of the living standard, the social and professional stratification, professional and educational activity, migration and emigration. They also appear in different theories, e.g. in the theories of needs, equal opportunities, social justice and others.

Income issues in agriculture are the subject of economic discussions mainly because of their continual declining tendency in the absolute dimension and in the relative one. Such matters as location, economic potential or the type of production of a farm exert, no doubt, an influence on income discrepancies in agriculture. A reduction in incomes from agriculture is also connected with different patterns of participating in changing economic market mechanisms and in the agricultural policy, both of them being subjects to globalisation. The future of traditional farming is often the topic of discussions. Other frequently appearing topics include: the variety of jobs done in agricultural families and issuing social benefits on behalf of the so-called social farms. Other aspects such as the national economy, the economic infrastructure or alternative sources of income also considerably influence on incomes from farming (Figure 2).

Theoretical analysis of the profitability phenomenon in agriculture is helpful in defining unified rules which are inevitable to formulate the postulates of income policy in order to address its activities to a strictly defined professional-and-social group. These needs are met by a multilayer statistical analysis which uses summary indices describing complex social and economic phenomena influencing the profitability of agriculture. One of the issues discussed in scientific papers is the problem of dynamics and income fluctuations in time. Such issues as the pace of changes, the range of increase or decrease in incomes, the time range or the spatial range of a given income situation, including poverty areas, have a basic meaning in evaluating the economic situation of an economic sector and the economy as a whole.

As the income from farming and its accumulation are the conditions of investments and determine the development of a farm, low incomes result in an impairment of in-

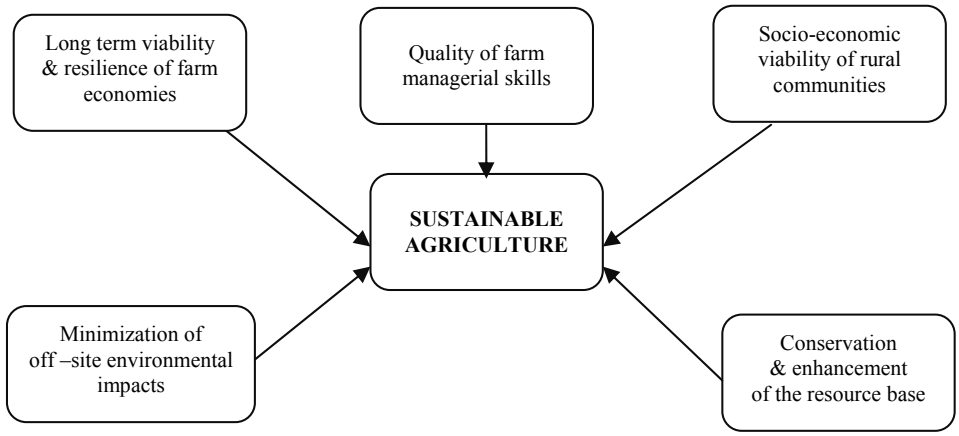

Fig. 2. Basic components of sustainable agriculture in sustainable economy
Rys. 2. Podstawowe składniki zrównoważonego rolnictwa w zrównoważonej gospodarce

Source: [OECD 2000].
Źródło: [OECD 2000].

vesting capacity and the lowering capital of farms. Long-term income disparity leads to migration and depopulation of farming regions, negative selection of the population of farmers, the descent of rural social and cultural societies and endangers the natural environment [Woś 1998].

The postulates concerning the state income policy are a consequence of the research on income differentiations. The disproportions or discrepancies in the economic development in the development of the economic area of a country, almost ignored in the hitherto income policy, have become an important argument for changes in the state agricultural policy towards its regionalisation. Its fundamental rule is a strive for equalising incomes and the standard of living within society. The aims of income policy concerning the farming population were included in European constitutive acts from the 1960s in the Treaties Roma – as an attempt at keeping a proper standard of life of the agricultural population by increasing the incomes of the employees in the farming sector and they were preserved in the EU Treaties – as an attempt at increasing the efficiency in farming and so ensuring a proper standard of rural life, especially by raising an individual income of the employees of the farming sector [Traktat 2006].

The issue of incomes from farming especially concerns preserving income parities in agriculture with regard to other sectors of economy and, therefore, of the incomes earned by farmers and the rest of the population. The problem is that there is no objective criterion which can be used as a basis to define a proper level of parity or the range of incomes [Leszczyńska 2007]. Accepting a given income differentiation originates from a set of historical, cultural and religious assumptions. Under certain circumstances, it can be vital for the political situation of a country. Market economy, based on the functioning of the market mechanism, differentiates the participation of various subjects in profits, according to the criterion of competitiveness and economic efficiency. Therefore, the issues of income parities remain open, especially with respect to social research and the

considerations over the level of social justice and the possible social tensions over income discrepancies. The basic task of income policy is solving the income issue structurally and diminishing the social and economic dysfunctions.

To summarise, in order to describe the state of agricultural sustainability in economy, various parities can be measured, i.e. adequate values regarding time are compared – their conditions, changeability and quality. According to the definition of sustainable agriculture, various elements remain in the state of equilibrium, i.e. they do not create advantages or disadvantages at the expense of other elements of the system, the time being taken into account in analyses. Socio-economic viability of rural communities is one of the most important component of sustainable development of agriculture. Its meaning is to receive incomes comparable to those of non-agricultural sectors.

CONCLUSIONS

The progress evaluation of the policy of sustainable agriculture requires a holistic approach, taking into account the whole of interactions between the farming sector and the national economy, society and the natural environment. Monitoring achievements is incredibly complicated and it requires a constant methodological development. The discussion on farming parity has always been present in relevant literature and the problem remains present. Nowadays, research is more and more commonly multidimensional. Traditional divisions are being replaced by integrative, interdisciplinary research. Income issues particularly link economic and social aspects and there is a tendency to use a methodological approach, characteristic for complex social phenomena.

The presented considerations do explain the complex issue of sustainable development of farming with the use of income parameters. They contribute to further detailed studies on the rules and aims of sustainable development of agriculture and rural areas and the criteria of evaluating the degree of meeting the aims of its multifunctional development. The following issues has been exemplified on measurement of sustainable agriculture:

- Indicators are required at different levels and for different uses. This has important implications for identifying and developing indicators. For example, at local or site specific levels, more detailed indicators may be required than at more aggregate levels.
- There is value in pursuing work to develop and use a core set of agri-environmental indicators, which are broadly comparable at the international level.
- Scale issues are especially important when developing indicators at the national and international levels. Indicators must be sensitive to regional variability in both environmental conditions and farming systems, across and even within countries, because national aggregates by themselves can mask variability and thus be misleading.
- Indicators must be capable of reflecting both negative externalities (e.g. water pollution from nutrients and pesticides) and positive externalities of agriculture (e.g. provision of habitat and carbon sinks).
- A sound analytical framework which clarifies on linkages and policy objectives is required. Indicator sets must also be and remain flexible and adaptive to respond to emerging issues, such as GMOs.

– The level of research and understanding varies across different groups of issues. For example, soil quality has been well researched, but more work is needed to deepen understanding in such areas as biodiversity, habitat and landscape.
– The social aspects of agriculture are presently less developed. This area requires more attention. Such work should start by determining key social issues, policy questions and objectives for these, and understanding the linkages between social and environment issues (e.g the influence of education levels on farm management). Analysis and understanding of possible tradeoffs and synergies between economic, environmental and social aspects of agriculture is also needed [OECD 2001].

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EKONOMICZNIE ZRÓWNOWAŻONE ROLNICTWO – KONCEPCJE I WSKAŹNIKI

Streszczenie. W artykule zaprezentowano różne koncepcje zrównoważonego rolnictwa. Podjęto próbę zdefiniowania ekonomicznego zrównoważenia rolnictwa i dyskusję nad sposobami jego pomiaru. Wskazano na kryteria oceny i mierniki stosowane przez OECD i Komisję Europejską (KE). Zastosowano metodę analizy systemowej dla równoczesnego zbadania różnych przejawów zrównoważenia, tj. ekonomicznego, środowiskowego, społecznego i instytucjonalnego. Ostatni z wymienionych aspektów został włączony ze względu na rolę interwencji państwa w omawianym sektorze. Uznano, że możliwość uzyskiwania trwałego parytetu dochodowego jest przede wszystkim miarą ekonomicznego i społecznego zrównoważenia rolnictwa w gospodarce narodowej.

Słowa kluczowe: rozwój zrównoważony, zrównoważenie ekonomiczne, zrównoważone rolnictwo, parytet dochodowy, rolnictwo wielofunkcyjne

Accepted for print – Zaakceptowano do druku 31.01.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 139–148*

INNOVATIVENESS OF FOOD PRODUCTION ENTERPRISES IN WIELKOPOLSKIE VOIVODSHIP FROM THE PERSPECTIVE OF PRODUCERS

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Abstract. The aim of the paper is to assess the impact of quality management systems on innovativeness at food manufacturing enterprises in Wielkopolskie Voivodship in 2009/2010 on the basis of 25 surveys carried out and 3 direct interviews conducted with managers. All analyzed enterprises have implemented at least one quality management system and carry out an innovative activity which positively influences their functioning. It contributes to greater diversification and quality of products, increase in sales and entering new markets, and increased flexibility of production processes. Quality management systems help to shorten the time necessary for development and implementation of innovations mainly by regulating processes, implementing improvement measures and drawing up responsibility. Half of the analyzed enterprises cooperate with the research and design sphere or other enterprises. Such cooperation is mainly triggered by the lack of their own technical knowledge and not sufficient research infrastructure, deficit of experience, incomplete knowledge of market needs and customers expectations. Another reason for taking up innovative activity was to keep or decrease the distance from competition and to increase profits. The above conclusions prove a positive link between quality management systems and innovative activities.

Key words: food production, innovation, innovative activity, Wielkopolskie Voivodship

INTRODUCTION

The manufacturing activity of Wielkopolskie Voivodship is characterized by a significant share of foodstuff brands. Production of food items constituting 26.25% of the sales value in 2009 is based on excellent raw material sources of agriculture in Wielkopolskie Voivodship[1]. Over half of all Polish food companies rated their economic situation as good or very good in June 2008 [Urban 2008]. One has to agree with the opinion of J. Drożdż that

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[1] Calculated from Rocznik Statystyczny Województwa Wielkopolskiego 2010, table 2(210).

"currently, for an enterprise to successfully compete with foreign companies it must offer not only competitive prices but also newer and more modern products. More and more companies understand this problem and are aware that a success is guaranteed not only by great inventions but also by constant improvement of quality and modernity of products offered" [Drożdż 2009]. For that reason both innovativeness and an efficient quality management system are so important.

Food manufacturing industry (Section D, group 15) belongs to low or medium-low technology according to OECD nomenclature. Food manufacturing plants in large extent belong to small and medium enterprises (SMEs). It does not, however, mean that this kind of industry is underdeveloped in terms of technology or innovativeness. It is natural that due to its significance this industry is dominated mainly by incremental innovations rather than radical ones. One may expect, however, that the number of processes, products and marketing innovations are high. For example, R. Herrmann noticed that such novelties as incremental innovations in food manufacturing may be grouped into different classes (comfortable, "light", ecological, ethnic, health, qualitative, nostalgic, etc.) [Herrmann 1997]. Enterprises which manufacture and support food production introduce many process, product, marketing and organizational innovations within the whole chain of values from the field to the table.

RESEARCH METHOD AND MATERIAL

The aim of the paper is to assess the relations between quality control systems and innovativeness at food manufacturing enterprises in 2009/2010 on the basis of the surveys carried out and direct interviews conducted with managers.

The questionnaires were presented to 140 enterprises from Wielkopolskie Voivodship and addressed directly to quality control managers in different companies. The questionnaire was correctly filled up by 25 food sector companies. All of them carry out the innovative activity on a daily basis and each of them possesses at least one system of quality management. They are differentiated in terms of size. There are three small companies among them (employing up to 49 people), 14 medium ones (employing from 50 to 249 people) and 4 big (250–499 employees) and very big (over 500 employees) companies respectively. All data was obtained via the Internet, telephone and also directly. Due to the unsatisfactory return of the questionnaire the direct interviews among managers in three companies were carried out in addition. Analyzed companies in almost equal terms act on the local market (21), national market (19) and among EU Member States and EFTA members (21) as well as other countries (14).

QUALITY MANAGEMENT SYSTEMS IN ANALYZED ENTERPRISES

All analyzed subjects have implemented at least one quality management system. Each of the 25 companies possesses the HACCP system (Hazard Analysis and Critical Control Points) which is obligatory or it was implemented on the basis of ISO 22000:2005 regulation (Food safety management systems. Requirements for any organization in a food chain). The second most commonly used system among the food manufacturing

enterprises is the quality management system based on the ISO 9001:2006 standard implemented by 16 companies. Eight companies implemented the systems based on wholesaler standards i.e. IFS (International Ford Standard) or BRC (British Retail Consortium. Global Standard-Food). Four larger enterprises concerned about their environment implemented an environmental management system based on the ISO 14001 standard and two of them possessed a safety management system according to the ISO 18001 standard. This data points to the existing discipline of all companies and respect for legal regulations and understanding of issues concerning safety of employees and environment. Most enterprises (16) implemented their quality management systems between 2003 and 2006 while four of them did this before 1999.

EFFECTS OF INNOVATIVENESS

Replies provided by respondents are shown in Table 1 and suggest that innovations positively affect company's activities in many ways. Everyone declares that it contributed to diversification of offered products. Innovations contributed to an increase in sales and share of current business activity or they enabled entry into new market segments or they contributed to an increased flexibility of production processes in nineteen companies. Thus, a better adjustment of the companies' offer to their customers' needs took place. As 18 managers noticed – innovations lead to an increase in product quality. Additionally,

Table 1. Importance of innovative activity for food producing enterprises
Tabela 1. Ważność działalności innowacyjnej dla przedsiębiorstw przetwarzających żywność

Effects of innovativeness	Number of replies
1. enabled entry into new market sectors, increased share in the market sector where a company remains active	19
2. replaced old products or processes with new ones	17
3. increased diversification of products	25
4. improvement of the production process' flexibility	19
5. increased effectiveness in utilizing a company's resources	14
6. increased quality of products	18
7. improved process of storage	10
8. increase in sales level	19
9. improvement in the occupational safety and health	10
10. decrease in negative impact on environment	15
11. superiority over competitors' actions/increase in a company's competitiveness	15
12. perceiving a company as competitive	10
13. decrease of product unit costs	11
14. decrease in the number of deficits and complaints	16
15. improved relations with customers and deliverers	16

Source: Own survey data.
Źródło: Badania własne.

17 respondents noticed that implementation of innovations resulted in rejuvenation of the product offer: new products replaced older ones which were subsequently removed from the market. As a result relations with recipients improved, the number of faults and faulty products decreased along with the number of complaints. Moreover, around 60% of respondents stated that introduction of innovations increased their competitiveness and effectiveness of utilizing resources and decreased their negative impact on natural environment.

In analyzed companies the innovative activity had quite a low impact upon them being perceived as competitive (10 companies) and also on cost reduction (only 10). The smallest number of enterprises (only 10) noticed an improvement in the storing up process.

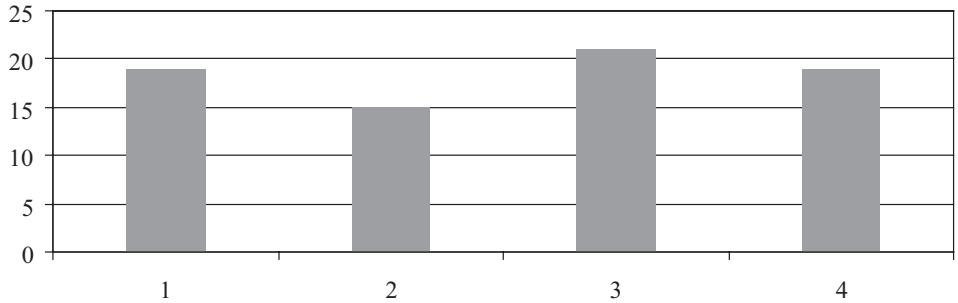
Obtained replies show that innovations bring many advantages and positively influence a company's business activity. What is most important, they increase the product diversification, the size of sale. They also improve product quality and enable exploration of new markets (higher scope for sale) as well as improve product flexibility. The effects of an innovative activity need to be kept balanced and in harmony. Similarly, keeping the balance between diversification of products, openness to new market segments and flexibility of production processes were all recommended by Sutcliffe, Sitkin and Browning [1999]. One can conclude that the leadership of the analyzed enterprises of food industry is fully aware how important innovations are. They bring profits and advantages in nearly every aspect of business activity – for products, processes and management. Thus, competitiveness increases. One of the most significant advantages is increase in product quality and subsequently more accurate fulfillment of customers' needs. This leads to an increased satisfaction and thus higher sales. However, only 11 companies noticed a positive impact of innovations on reducing costs of production. Such an opinion might stem from the fact that in the initial period of implementing innovations the costs are usually high and they influence this opinion.

QUALITY MANAGEMENT SYSTEMS AND INNOVATIONS IN FOOD SECTOR COMPANIES

Representatives of all analyzed companies replied that the implemented quality management systems facilitate the realization of an innovation strategy regarding products and technologies (19), distribution (12), sales of products (17) or organization (17). Majority believe that regulating many aspects of a company's organization required during implementation of management systems (i.e. process approach, process map, hazard analysis, descriptions of products, procedures, instructions, records, etc.) shortens the time needed for preparation and implementation of innovations.

Figure 1 shows spheres of companies' activity and the frequency with which quality management systems facilitated the initiation of innovations.

It is interesting that quality management systems activated activities aimed at reaching improvement in 21 out of 25 food sector companies. Such actions may lead to small incremental innovations which accumulate and thus improve product's quality. Nearly as important for companies, was to regulate communication and processes within the framework of organization and more efficient specification of responsibility (19 "yes"



1 – regulate communication and processes, 2 – improved their communication with other companies, 3 – reaching improvement 4 – more efficient specification of responsibility
1 – uporządkowanie komunikacji i procesów, 2 – poprawa komunikacji z innymi przedsiębiorstwami, 3 – określenie odpowiedzialności, 4 – działania doskonalące

Fig. 1. Spheres where quality management systems help to initiate innovations
Rys. 1. Sfery, w których system zarządzania jakością pomaga inicjować innowacje

Source: Own study.
Źródło: Badania własne.

answers). Regulating internal processes and structures carries a large potential for growth within the organizational activity. In turn around 60% of enterprises stated that a quality management system improved their communication with other companies. A more efficient communication with recipients and deliverers forms a potential source of innovations which aim at better fulfillment of contracting parties' expectations.

Systems of quality management quite efficiently prepare a company (in organizational terms) for implementing future innovations. Employees occupying production positions must possess knowledge regarding sources of faults and defects and must be able to differentiate between systematic and accidental mistakes. Such an approach required introduction of many organizational innovations regarding the control of production quality (statistical process control, Kazein, Six Sigma, QFD, good manufacturing and hygienic practice etc.) at production halls. Despite the fact that Deming's [1982] philosophy did not concentrate on product innovations or process innovations as such but rather on persistence and systematic pursuit of improving the quality management system it brought huge profits and altered awareness and strengthened the quality of social capital. It supports control of systems and processes in an enterprise by standardization of technologies and feedback [Douglas 2001]. According to other authors the "positive impact of a quality management system used upon innovativeness gets noticed by a company's key customers". In addition internal assessment revealed an improvement and better regulated actions and processes (including introduction of new ones), increase in quality of products, increase in work efficiency and reduction in the number of shortages and complaints. Within the above context one can come to conclusion that the introduction of quality management systems stimulates innovativeness mainly through the necessity to meet requirements of certain standards at the level of system implementation and later as a result of significant changes in company's functioning [Goszka, Bałdyga 2008]. Similar notions can be found in foreign literature on the subject [Martinez-Costa, Martinez-Lorente 2008, Mokhtar, Yusof 2010, Hung, Lien, Fang, McLean 2010].

COOPERATION OF ENTERPRISES

Cooperation of an enterprise regarding an innovative activity with its environment remains a weak point of most business entities. According to data obtained for the whole industrial food processing [Zalewski, Talaga 2011] most innovative companies do not declare any need for cooperation with other geographically close entities from the same sector or even those further away (horizontal cooperation). Such a behavior points to the fact that enterprises do not know and do not utilize the benefits stemming from business clusters [Skawińska, Zalewski 2009]. They assume (and this is proven in practice) that enterprises of similar production profile should cooperate locally in aid of development and innovativeness – and compete on the market at the same time. This increases the competitive advantage of a region. Similarly, most innovative companies from the industrial food processing sector (section D) regard cooperation with the scientific sector and R&D as of little importance [Zalewski, Talaga 2011]. The lack of cooperation between science and industry in today's era of knowledge based economy forms a serious developmental drawback.

Respondents from food sector enterprises who participated in the study manifest higher than average understanding of the above developmental determinants.

Almost half of the analyzed organizational units (12) declare cooperation with the science sector or with other companies from its environment for one of three reasons. Nine companies began cooperating with the science sector because they lacked their own knowledge or experience necessary to commercialize innovations. For eight companies the reason was to decrease the distance to competition or to reduce costs.

Seventeen companies do not cooperate with the closest business environment. Eight respondents stated that their enterprises undertook cooperation with other companies under pressure from deliverers and recipients in the value chain and six stated that they were looking for a business partner with special abilities or competences. Only at six companies the importance of those two reasons together was taken into consideration. In none of the companies they were looking for possibility for combining one's resources with those of another company or to reduce costs.

The above results prove that cooperation of companies with the science sector takes place only when a company does not possess its own knowledge or resources to reach a specific target. This also suggests that among the Greater Poland food sector enterprises in most cases the "closed" model of creating innovations takes place – meaning that they are designed and developed "secretly". Such a model of "closed" innovations in many economies or sectors in recent years has been replaced by an "open innovation" [Zalewski 2010] model, first described by Chesbrough [2003].

INNOVATIONS AND QUALITY MANAGEMENT SYSTEMS – CASE STUDY

A direct interview was conducted among the management representatives of food production companies of Greater Poland:

- dairy cooperative,
- bakery/confectionery cooperative,
- fruit-vegetable processing company.

The interview form was based on questions from the questionnaire. Among the aforementioned entities one company belongs to medium and two belong to large enterprises with long tradition. The fruit-vegetable company belongs to foreign capital while the remaining companies represent the national capital.

The dairy cooperative tops in the ranking of national dairy cooperatives every year. In January 2010 the company introduced a significant product innovation – the condensed milk with magnesium. Numerous prizes prove high quality of its products. "The plant is equipped with modern production lines to manufacture condensed milk both sweetened and non-sweetened in carton containers and cans, condensed non-sweetened light milk, flavored milk in tubes, UHT creams, UHT milk, butter, powdered granulated low-fat milk and a whole range o fresh products. Modern lines for aseptic confectioning of products allow for the use of carton containers of different size and carton containers in the form of multipacks"[2].

This enterprise remains active on local and national markets as well as in EU, EFTA, candidates to EU and also other countries. However, the national market remains the most significant for this company. Between 2008 and 2009 the state of employment in this company was around 500 employees.

The dairy cooperative has introduced the following quality management systems: HACCP (2000), ISO 9001 (1994) and BRC (2005). Among the most important positive changes resulting from the innovative activity was an improvement of product quality, improvement in product diversification, replacement of old products or processes with new ones, improvement of a production process' flexibility and also entry into new markets. Other positive changes which took place to a lesser extent than the above include the outstripping of competition's actions, improved relations with customers, decrease in the number of shortages and complaints, improvement in the storage process and decrease in negative environmental impact.

The company positively replied to a question regarding existence of a positive correlation between quality management systems and the innovative activity. Simultaneously the time of the innovations' commercialization has been shortened. Chairman of the creamery underlined that the quality management systems facilitated implementation of innovations in the field of products, distribution, sales and organization – a positive reply to all questions asked. He also noticed that proper functioning of the quality management system facilitates initiation of innovations because it enforces constant improvement of internal communication and communication with customers and deliverers, improvement in processes, organization, marketing and current definition of responsibility. Moreover, the response to complaints has been improved along with recording and analyzing data regarding quality of recertifying audits etc.

The company eagerly cooperates with the science sector (universities, external laboratories) due to the lack of its own R&D infrastructure.

Bakery/confectionery cooperative is a company specializing in bakery products, cakes and ice-creams. This enterprise takes lead among bread producers in Greater Poland and its tradition goes back over 100 years.

[2] Quotation from company's folder.

The analyzed entity mainly operates locally but also nationally and in different EU Member States. In 2008 and 2009 this company had over 320 employees. The company possesses the HACCP system implemented between 2003 and 2006.

Many positive changes stemming from the innovative activity were noticed. The most important include: improvement in product quality, entering new markets, replacement of old products or processes with the new ones and diversification of product offer. The innovative activity has also moderately influenced an improvement of the production process' flexibility, more effective utilization of own resources, decrease in shortages, complaints, improved relations with customers and deliverers. The company has decreased its negative impact on the natural environment by using more modern baking technologies and improving its waste management. Customers began to perceive this enterprise as innovative.

A positive correlation between the quality management systems and innovations has been noticed. It has been stated that the process of implementing innovations runs more smoothly regarding products, technologies and organization. It has also been noticed that at present it is easier to communicate with other enterprises from the same sector. It was very important for the company to set the extents of responsibility. The time needed for an innovation to get implemented was significantly shortened due to a greater role of improvement activities.

The analyzed subject cooperates with companies from its own sector and with the science sector thus manifesting its desire to keep or decrease its distance from competition and the need to cooperate with customers, recipients and deliverers.

Fruit-vegetable processing company specializes in manufacturing of tomatoes. Its activity fits in the sector of remaining food products (according to the Central Statistical Office – group and section D 15.8.). Apart from the aforementioned product groups this enterprise prepares dishes ready for consumption and this kind of production has been growing systematically. This company has been active for many years and is one of the leaders in its sector. Currently, the majority of this company's shares belong to a foreign investor. The analyzed company remains active on local and national markets as well as in EU Member States and EFTA countries. In 2008–2009 the company employed around 440 people.

This enterprise possesses the following management systems: HACCP, ISO 9001, ISO 14001, ISO 18001, and also the BRC. The first quality system was implemented between 1999 and 2002, which points to understanding the role of quality and safety in the production and distribution process.

A representative from the board of directors believes that an innovative activity carries an enormously positive impact for the whole company. Once again the role of innovation has been underlined regarding product quality, consumers' satisfaction, manufacturing new products for the sake of diversification and replacement of the old ones. As one of a few this company managed to lower its production unit costs. This may result from its technological advancement, innovativeness, large scale of manufacturing, good cooperation with growers – deliverers of raw materials and proximity of raw material source.

The company's management has noticed a positive correlation between quality management systems and innovations. It has been stated that thanks to such systems the time needed to implement innovations becomes shorter. Moreover, they have realized that such systems have positively influenced the strategy of innovations (facilitating and ac-

celerating implementation of innovations regarding products, technologies, sale, distribution and alike). They have understood that regulating processes, improvement activities, better communication with external organizational units (reached due to quality systems) intensify invention which is the beginning of any innovation.

The company does not cooperate with national scientific units or any other companies from its sector. It only utilizes internal resources of its group of companies in the process of implementing innovations.

CONCLUSIONS

All analyzed enterprises carry out an innovative activity and have implemented at least one quality control system. An innovative activity positively influences their functioning. It contributes to greater diversification and quality of products, increase in sales and entering new markets, and increased flexibility of production processes.

Quality management systems help to shorten the time necessary for development and implementation of innovations mainly by regulating processes, implementing improvement measures and drawing up responsibility.

Half of the analyzed enterprises cooperate with the science sector or other enterprises. Such cooperation is mainly triggered by the lack of their own technical knowledge and no research infrastructure, deficit of experience, incomplete knowledge of market needs and customers.

Another reason for taking up innovative activity was to keep or decrease the distance from competition and to increase profits.

The above conclusions prove the positive correlations between the innovative activity and the quality management systems.

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ACKNOWLEDGMENT

This research has been conducted within the research project 2657/B/H03/2010/39 Ministry of Science and Higher Education.

INNOWACYJNOŚĆ PRZEDSIĘBIORSTW PRZETWÓRSTWA ŻYWNOŚCI W WIELKOPOLSCE W OPINII PRODUCENTÓW

Streszczenie. Celem niniejszego artykułu jest ocena wpływu systemów zarządzania jakością na innowacyjność przedsiębiorstw przetwórstwa żywności w Wielkopolsce w latach 2009/2010 na podstawie przeprowadzonych badań ankietowych w 25 firmach i 3 bezpośrednich wywiadów wśród menedżerów. Wszystkie analizowane przedsiębiorstwa wdrożyły co najmniej jeden system zarządzania jakością i prowadzą działalność innowacyjną, która ma pozytywny wpływ na ich funkcjonowanie. Przejawia się on w zwiększeniu różnorodności i polepszeniu jakości wyrobów, we wzroście poziomu sprzedaży, w ułatwieniu wejścia na nowe rynki oraz zwiększeniu elastyczności procesów produkcji. Systemy zarządzania jakością pomagają skrócić czas opracowania i wdrażania innowacji, głównie przez uporządkowanie i doskonalenie procesów oraz określenie odpowiedzialności. Połowa ankietowanych przedsiębiorstw współpracuje z sektorem nauki lub przedsiębiorstwami o podobnym profilu działalności. Ta kooperacja wynika przede wszystkim z braku wystarczającej wiedzy technicznej i infrastruktury badawczej, niedostatku doświadczenia, niepełnej znajomości potrzeb rynku i klientów. Powodem podejmowania działalności innowacyjnej była również chęć utrzymania lub zmniejszenia dystansu do konkurencji i zwiększenia zysku. Przedstawione wnioski potwierdzają dodatni wpływ systemów zarządzania jakością i aktywnością innowacyjną.

Słowa kluczowe: produkcja żywności, innowacje, aktywność innowacyjna, Wielkopolska

Accepted for print – Zaakceptowano do druku 27.01.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 149–158*

LOCAL GOVERNANCE ACTIVITIES IN SUPPORTING FISHERIES AND TOURISM OF THE SZCZECIN BAY

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Abstract. Communes located by the Szczecin Bay have insufficiently supported fisheries and tourism in spite of being provided with good conditions for their development. The results of questionnaires and surveys held in 2008–2010 indicate that local self-governments gradually communalized fishing ports and offered advisory support for fisherman. Additionally, they showed a flexible approach towards the adjustment of rental fees for port utilities as well as property taxes. The lack of support or its being insufficient resulted partly from inadequate knowledge of problems by local authorities and partly because of the lack of financial resources for maintaining ports, implementing the indispensable infrastructural investments as well as meeting other needs for development. In 2009, the Maritime Office started transferring to local authorities tax fees on estates located under the waters of the Szczecin Bay. The financial situation of the local communities has been essentially improved. With the provided financial means, local authorities were able to prepare and pre-finance projects allowing them to apply for the EU co-financing of infrastructural development projects and other needs connected with tourism and fisheries.

Key words: economic development, local governance

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INTRODUCTION

The scope of a commune's activity includes public matters of local significance which result from the act of the commune self-government [Act of 8 March 1990 on commune self-government…]. Communes located by the Szczecin Bay are mostly classified as rural areas. Due to their location they are provided with ideal conditions for the development of fisheries and tourism, especially water tourism. Each commune owns a fishing port. These are the attributes that require support from local authorities in order to allow their full exploitation.

The aim of this article is to present and evaluate the activities undertaken by local authorities with regard to development on the example of fisheries and tourism of the communes located by the Szczecin Bay. The research hypothesis that was put forward stated that the significance of fisheries of the Szczecin Bay and tourism in the development of communes there located was rather low and the barrier in the development consisted in the lack of possibilities and support for fisheries from the local authorities.

The territorial scope of the research encompassed communes situated in the Polish part of the Szczecin Bay and the Dąbie Lake. The research was based on the materials gathered in the years 2008–2010 as a result of complex survey activity conducted in the communes and among fishermen, a part of which was included in the following study.

The selection of communes was intentional. The sample group included the entities located in rural areas (6), directly by the Szczecin Bay with small fishing ports dealing with bay fisheries, and namely: Nowe Warpno, Police, Stepnica, Wolin, Kamień Pomorski and Międzyzdroje. The communes received questionnaires, all of which were returned. The conducted verification allowed to include those communes in further research.

The research sample among fishermen was designated according to the following two criteria: 1) It was required that fishermen were officially entitled to fishing in the area of the Szczecin Bay, i.e. had suitable permits and fishing licenses. Thus, the respondents included only shipowners or co-shipowners. 2) Fishermen needed to be active in the period covered by the research. The statistical population amounted to 147 respondents (100%), all of whom received questionnaires. The number of the returned questionnaires reached 92, of which, after verification, 90 were qualified for further research, i.e. 61.2% of the bay fishermen. Research results were verified in the years 2009 and 2010 with the use of the in-depth interview method and observation during study tours.

THE SIGNIFICANCE OF THE FISHERIES OF THE SZCZECIN BAY AND TOURISM FOR COMMUNAL DEVELOPMENT

The communes located in the Bay are classified as urban-rural and rural communes. Industry in those communes does not play a significant role, with the exception of the communes of Stepnica and Police. For this reason, the communes should seek opportunities for their development among the economic functions other than industry (see among others Stola [1987, p. 25], Dietl and Gregor [1979, pp. 80–96]). Such functions include fisheries and tourism.

Self-governments tend not to perceive fisheries as very significant. This sector is mostly appreciated in the commune of Nowe Warpno, and thought of as being as of little importance in Wolin and the remaining communes.

Not all of the self-governments were able to see the positive impact of fisheries on local communities (Table 1). According to the local authorities of Kamień Pomorski and Wolin fishery is and will not be important for communal development. The remaining communes appreciated the role of fishery in their development, since it allows for the creation of new jobs (Stepnica, Police, Międzyzdroje), attracts tourists (Stepnica, Police, Nowe Warpno) are contributes to the creation of the commune image (Nowe Warpno).

All of the local authorities, except for Kamień Pomorski, see the positive role of tourism in communal development. It constitutes an element of the historical and cultural tradition of the region and is treated as "[…] the heart of the local culture, designating social customs and standards, shaping the hierarchy of social prestige and organizing social life of the inhabitants" [Marciniak 2008, p. 12].

According to the researched local entities, tourism constitutes the most prospective economic function. The communes of the Szczecin Bay also appreciate the value of the fishing ports located in their areas, since port structures constitute the technical base necessary for conducting fishing and tourist activities.

Each commune owns a fishing port constituting a multifunctional economic structure (Tab. 2). The basic form of activity is fishing; however, recently tourism has begun gaining importance. Only the port in Stepnica conducts an additional transshipping activity (transport function). In the remaining ports, except for Lubin, this function constitutes a potential sphere of activity [Miszczuk 1999, pp. 67, 70, 74].

Table 1. The role of fisheries in the development of communes in the opinion of the local authorities

Tabela 1. Rola rybołówstwa w rozwoju gmin w opinii władz lokalnych

Commune	Plays no role in communal development	Impedes communal development	Creates working places for the inhabitants of the commune	Attracts tourists	Other
Kamień Pomorski	X				
Stepnica			X	X	
Police			X	X	
Wolin	X				
Nowe Warpno				X	creating commune image
Międzyzdroje			X		

Source: Self-study prepared on the basis of the research conducted in 2008, verified in 2009 and 2010.

Źródło: Opracowanie własne na podstawie badań przeprowadzonych w 2008 r., zweryfikowane w latach 2009 i 2010.

Table 2. Functions of the fishing ports of the Szczecin Bay
Tabela 2. Funkcje portów rybackich Zalewu Szczecińskiego

Commune name (port)	Function type		
	Fishing	Tourism	Transport
Kamień Pomorski (Kamień Pomorski)	+	+	–
Stepnica (Stepnica)	+	+	–
Police (Trzebież)	+	+	–
Wolin (Wolin)	+	+	–
Nowe Warpno (Nowe Warpno)	+	+	–
Międzyzdroje (Lubin)	+	+	–

Key: + function realized by the port; – function not realized by the port

Source: Self-study prepared on the basis of the research conducted between 2008–2010.
Źródło: Opracowanie własne na podstawie badań przeprowadzonych w latach 2008–2010.

THE EVALUATION OF THE GENERAL SITUATION OF FISHERIES OF THE SZCZECIN BAY BY COMMUNE SELF-GOVERNMENTS

Supporting of fishery development by commune self-governments requires their being aware of its general situation. Research showed that this kind of knowledge is not always sufficient. The authorities of Kamień Pomorski, for instance, were not able to evaluate the situation of fisheries and fishermen in the commune, in Nowe Warpno they assessed it as very bad, and in Wolin as bad. Międzyzdroje, Stepnica and Police evaluated it as good or very good. According to local authorities, the unfavourable situation of fisheries in the region results mainly from the lack of resources for new equipment, fry-stocking and fishermen's initiative. This is proved by fishermen's resignation from work and a significant reduction of fishing boats.

The bad condition of fisheries in some of the communes of the Szczecin Bay forced fishermen to change the type of the conducted activity. Tourism may be an alternative for them. In the opinion of self-governments, the region of the Szczecin Bay provides favourable natural conditions for the development of this economic function. Unfortunately, it is impeded by the bad technical condition of tourist infrastructure and the low number of passenger boats unable to keep the pace with the growing demand for cruises on the Szczecin Bay.

The element that is indispensable in supporting the fisheries of the Szczecin Bay and tourism is maintaining of the fishing ports. The act of 20 December 1996 on sea ports and harbours opened the possibility of their communalization and acquisition by self governments, which seem to be the most suitable managing entities [Sosidko 2004, pp. 119–130]. This is confirmed with the results of the research conducted in the communalized ports of the Szczecin Bay – Stepnica (the commune of Stepnica was the first commune in Poland to carry out communalization of a fishing port [Pluciński 1999, pp. 22–29]), in Nowe Warpno and Kamień Pomorski (communalization was carried out in December 2010).

By managing the port areas the communes were able to realize many more tasks as compared with the previous port administrator – the Maritime Office in Szczecin – see Table 3. Competences of the Maritime Office were limited by the act of 21 March 1991 on mari-

Table 3. The scope of tasks realized by entities managing fishing ports – commune authorities and Maritime Offices

Tabela 3. Zakres zadań realizowanych przez podmioty zarządzające portami rybackimi – gminy oraz Urząd Morski

Tasks	Entities managing the ports	
	Communes[1]	Maritime Offices[2]
Managing port utilities and infrastructure	+	+
Predicting, programming and planning port development	+	–
Construction, extension, maintenance and modernization of port infrastructure	+	+
Land acquisition for port development	+	–
Provision of services related to the use of port infrastructure	+	–
Promotion and gaining users	+	–
Harmonization of port development with the commune	+	–

Key: Communesą[1] – the ports managed by communes included Stepnica, Nowe Warpno, Kamień Pomorski; by Maritime Offices[2] – Trzebież, Wolin, Lubin.

Source: Self-study based on the research conducted in 2008–2010.
Źródło: Opracowanie własne na podstawie badań przeprowadzonych w latach 2008–2010.

time areas of the Republic of Poland and maritime administration, narrowing them down to the activities related to financing and managing infrastructure and port lands [Pluciński i Sosidko 2007, p. 3].

The other tasks, especially those related to formulating forecasts, programming and planning port development, land acquisition for the ports' developmental needs, conducting promoting activities, gaining new users and harmonizing port development with commune development were practically overlooked by Maritime Offices. Communes, on the other hand, were prepared to carry out all the tasks being the responsibility of an entity managing the ports.

In the other ports state or mixed property – state-communal – prevailed, and the managing entity was the Maritime Office in Szczecin. Communes did not take the opportunity of their communalization, since local authorities were concerned that the profits made by the ports would not cover the costs of their maintenance. What was also of significance was the decapitalized port infrastructure and the necessity of providing large sums for its modernization [Leśniewski 2007, p. 56].

In the recent period the situation began to change. In the face of the communes' better access to resources for their modernization, the bad technical condition of the infrastructure is no longer the barrier preventing port communalization. It is proved with the example of the recently acquired port by the commune of Kamień Pomorski.

SUPPORTING FISHERIES AND TOURISM OF THE SZCZECIN BAY BY COMMUNAL AUTHORITIES

Survey results indicate that each of the researched self-government units declared its willingness to support fisheries. The most commonly offered kind of help involved advisory support (in Kamień Pomorski, Police, Międzyzdroje), and the most diversified

forms of support for fishermen (organizational, legal, advisory support) were noted in the commune of Międzyzdroje. However, what mattered most were the specific examples of support offered by local authorities, which are presented in Table 4 below.

Only the authorities of Nowe Warpno and Stepnica could specify the concrete activities that allowed to provide their fishermen with some financial support in their difficult situation. The provided help consisted in their showing flexible approach in adjusting the lease fees for using the fishing port facilities and the property tax amounts. A part of the surveyed communes also supported tourist activity related to fisheries. The self-goverments of Stepnica, Polica, Wolin and Nowe Warpno organized annual sports-cultural events for their inhabitants and tourists (Table 5). According to the surveyed communes they were to promote the region and sustain its historical and cultural values.

An important task of local self-governments is to acquire the EU funds for full-scale restructuring and modernization of the state's economy. In the researched period only the commune of Stepnica made use of the EU funds aimed at supporting fisheries. It received nearly PLN 2.5 million from the Sectoral Operational Programme "Fisheries and Fish Processing 2004–2006". With the use of the acquired funds the commune was able to renovate the port basin and equipment, purchase new devices and plan other works. The remaining five communes failed to take the opportunity of port modernization provided by the EU funds. The main reason was the lack of resources for co-financing of investments and the difficulties with their pre-financing, what was particularly emphasized by the authorities of Nowe Warpno. Moreover, they were mostly small communes with relatively small budgets, for whom the costs of preparing the projects already constituted a large financial burden.

Table 4. Financial support of communal local authorities for fishermen in the years 2003–2010
Tabela 4. Pomoc finansowa władz badanych gmin skierowana do rybaków w latach 2003–2010

Year / Commune	2003	2004	2005	2006	2007	2008	2009	2010
Kamień Pomorski	no	no	no	no	no	no	no	no
Stepnica	deferred lease payment	deferred lease payment	reduction of lease fee (PLN 9,000)	reduction of lease fee (PLN 9,000)	no	no	no	no
Police	no	no	no	no	no	no	no	no
Wolin	no	no	no	no	no	no	no	no
Nowe Warpno	no	remitted lease fee (PLN 9076.96) remitted property tax (PLN 292)	remitted property tax (PLN 7410.09)	remitted property tax (PLN 4974)	no	remitted lease fee (PLN 466) remitted property tax (PLN 448)	remitted property tax (PLN 789)	no
Międzyzdroje	no	no	no	no	no	no	no	no

Source: Self-study based on the research conducted in 2010.
Źródło: Opracowanie własne na podstawie badań przeprowadzonych w 2010 r.

In 2009 the communes began to show more interest in obtaining the EU funds when their budget situation radically improved as a result of reimbursing by the Maritime Office in Szczecin of the tax on communal lands located under the waters of the Szczecin Bay.

The first commune to receive the tax reimbursement in 2009 was Stepnica. The total amount of the resources to be paid out in installments reached PLN 104 million. To understand the size of this amount let us only state that the yearly budget of Stepnica reaches approximately PLN 6 million. Among the remaining communes, Nowe Warpno will receive PLN 130 million, Kamień Pomorski – PLN 15 million, Police – PLN 9 million. The amounts of tax reimbursements for Wolin and Międzydroje are still under calculation [Ziębka 2009]. As a result of receiving those resources the authorities of Kamień Pomorski decided to start the construction of a yacht port within the project "The Tourist Trail of the West Pomeranian Region". The ports selected for the investment project – The Network of Touristic Ports of West Pomerania "The Tourist Trail of the West Pomeranian Region" are situated in the areas of the communes of Kamień Pomorski, Wolin and Międzyzdroje. The investments (construction of new yacht marinas) are co-financed from the resources of the Operational Programme Innovative Economy [Zachodniopomorski Szlak… 2011]. Its value is estimated at PLN 19 million, of which PLN 7 million come from the Operational Programme Innovative Economy. The remaining resources come from the tax reimbursement. The investment works will be started at the beginning of 2011, and the planned completion period is autumn 2011 [Powstanie nowoczesna… 2010].

The improvement in the financial situation also led to commencing of the construction works on a yacht marina in Wolin. The investment, initially rejected by the commune authorities, was approved after guaranteeing tax reimbursement by the Maritime Office in Szczecin. Its estimated cost amounts to PLN 7 million, of which PLN 4 million is financed from the resources of the EU [Zachodniopomorski Szlak… 2010]. Morever, the communes of Międzyzdroje, Wolin and Stepnica will in the years 2011–2015 have at their disposal over PLN 34 million for the realization of projects related to fisheries and tourism (construction of sailing marinas and piers, stocking of bodies of water, opening passages of rivers, renovation of

Table 5. Sports and cultural events connected with the fisheries of the Szczecin Bay organized by the communes in the years 2003–2010

Tabela 5. Imprezy kulturowo-sportowe związane z rybołówstwem Zalewu Szczecińskiego organizowane przez gminy w latach 2003–2010

Commune	No[1]	Yes[2]	Event
Kamień Pomorski	X		
Stepnica		X	"Bread and Fish Day" Fest
Police		X	„Trzebież Time", „Trzebież Neptunalia"
Wolin		X	Mayor of Wolin Cup "Regatta"
Nowe Warpno		X	„Bream Fest"
Międzyzdroje	X		

Key: No[1] – the event was not organized, Yes[2] – the event was organized.

Source: Self-study based on the research conducted in the years 2008–2010.

Źródło: Opracowanie własne na podstawie badań przeprowadzonych w latach 2008–2010.

Table 6. Financial support for fisheries and tourism of the Szczecin Bay provided by the researched communes

Tabela 6. Finansowe wsparcie rybołówstwa i turystyki Zalewu Szczecińskiego przez badane gminy

Commune	Support type[1] and its value (thous. PLN)		
	Port investments	Support of fisheries and tourism co-financed from the OP "Fisheries 2007–2013"[2]	Other support
Kamień Pomorski	Construction of a yacht marina – 19 000	No	No
Stepnica	Modernization of the fishing part of the port – 25 000	Projects related to fishing and tourist activities (in total for three communes) – 34 000	Remittance of lease fees for fishermen – 18
Police	No	No	No
Wolin	Construction of a yacht marina – 7 000	Projects related to fishing and tourist activities (in total for three communes) – 34 000	No
Nowe Warpno	No	No	Remittance of property tax and lease feast for fishermen – 23.46
Międzyzdroje	No	Projects related to fishing and tourist activities (in total for three communes) – 34 000	No

Key: Support typeą – refers to projects already completed, in progress and those with guaranteed financial support; OP "Fisheries 2007–2013"¸ – Operational Programme "Sustainable development of the fisheries sector and coastal fishing areas 2007–2013" (three communes will be able to benefit from the programme – Stepnica, Wolin, Międzyzdroje, with the total amount at their disposal of PLN 34 million).

Source: Self-study based on: Powstanie nowoczesna… 2010; Zachodniopomorski Szlak… 2010; Ponad 90 milionów… 2010.

Źródło: Opracowanie własne na podstawie: Source: self-study based on: Powstanie nowoczesna… 2010; Zachodniopomorski Szlak… 2010; Ponad 90 milionów… 2010.

boats, providing special fishing grounds, organization of fishing fairs, trainings, etc.). The investment projects will be co-financed from the Operational Programme "Sustainable development of the fisheries sector and the coastal fishing areas 2007–2013", where the financing will reach 60-100% [Ponad 90 milionów… 2010].

The communes of Nowe Warpno, Police and Międzyzdroje have not yet taken the decisions on the realization of investment projects. However, there is no doubt that the future reimbursement from the Maritime Office in Szczecin will influence their investment activity.

Table 6 below presents the values of the financial support for fisheries and tourism of the Szczecin Bay in the researched communes. It covers infrastructural investments realized in fishing ports, projects related to fisheries and tourism co-financed from the OP "Fisheries 2007–2013" from which the resources will be available in the years 2011–2015, as well as other kinds of support (lease fees or property tax remittance for fishermen).

CONCLUSIONS

The location of the researched communes and the ports operating within them result in the communes' having the suitable conditions for the development of fisheries and tourism, particularly water tourism, which has an impact on the development of the Bay communes.

Commune self-governments differ in their assessment of the situation of fisheries and fishermen. Irrespective of this assessment, fishing ports in the communes have undergone either complete (Stepnica, Nowe Warpno) or partial (Police, Międzyzdroje) communalization.

Research results indicate that each of the surveyed communes declared their willingness of supporting fisheries. The most commonly offered kind of help involved advisory support. Only the communes of Nowe Warpno and Stepnica offered financial support to the fishermen by showing a flexible approach towards the adjustment of the lease fees of the fishing port facilities and property tax amounts. Some of the communes also supported tourist activity related to fisheries. The authorities of Stepnica, Police, Wolin and Nowe Warpno held annual sports and cultural events which were to promote the region and sustain its historical and cultural values.

In 2009 the financial situation of the communes significantly improved as a result of reimbursing by the Maritime Office in Szczecin of the tax on communal lands located under the waters of the Szczecin Bay. With the provided financial means, local authorities were able to prepare and pre-finance projects allowing them to apply for the EU co-financing of infrastructural development projects and other needs connected with tourism and fisheries.

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DZIAŁANIA WŁADZ LOKALNYCH WE WSPIERANIU RYBOŁÓWSTWA I TURYSTYKI ZALEWU SZCZECIŃSKIEGO

Streszczenie. Gminy zlokalizowane nad Zalewem Szczecińskim nie wspierały dostatecznie rybołówstwa i turystyki pomimo dobrych warunków do ich rozwoju. Wyniki badań ankietowych oraz wywiadów pogłębionych przeprowadzonych w latach 2008–2010 wskazują, że władze lokalne stopniowo skomunalizowały porty rybackie, oferowały rybakom pomoc doradczą. Ponadto wykazywały elastyczność w podejściu do opłat czynszu dzierżawnego za użytkowanie portu rybackiego oraz podatku od nieruchomości. Brak lub niewielkie wsparcie wynikały częściowo z niedostatecznej znajomości przez władze problemów a częściowo z braku finansowych środków na utrzymanie portów, na niezbędne inwestycje infrastrukturalne oraz inne potrzeby rozwojowe. Od 2009 roku Urząd Morski zaczął przekazywać gminom podatek od gruntów komunalnych znajdujących się pod wodami Zalewu Szczecińskiego, co znacznie poprawiło sytuację finansową gmin. Mając środki na przygotowanie i prefinansowanie projektów, gminy mogły zacząć ubiegać się o środki unijne na rozwój infrastruktury i inne wydatki związane z rozwojem turystyki i rybołówstwa.

Słowa kluczowe: rozwój gospodarczy, samorząd lokalny

Accepted for print – Zaakceptowano do druku 13.02.2011

ACTA SCIENTIARUM POLONORUM *Oeconomia 10 (1) 2011, 159–169*

CHANGES IN RURAL WOMEN'S MOVEMENT RELATED TO POLAND'S ACCESSION TO THE EUROPEAN UNION

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Abstract. Both the accession of Poland to the EU in 2004 and pre-accession period had a positive influence on changes that occurred in countryside. They particularly concern the movement of rural women, who undertake volunteer activity by implementing projects financed by the EU funds for the behave of women and local communities. At the same time they cooperate with local authorities. However, the rural women's emancipation proceeds differently in comparison with women living in cities and towns. While being rather conservative in moral sphere, rural women are aware of social changes and perceive possibilities of personal development. Voluntary work constitutes an additional occupation for them. The fact that women's organizations became independent is the most important change in the rural women's movement over the last decade.

Key words: rural women's movement, village women's club, women's associations, social activity, European Union, Poland

INTRODUCTION

In relation to the accession of Poland to the European Union some positive changes can be observed in the countryside. Two most important aspects of these changes should be mentioned: economic and social. The second one particularly affects women who become involved in social activity with the people around them and at the same time do not forget about their personal development. The observations and research on changes in the rural women's movement were confirmed during the interviews with local activists, reading the press articles and analysis of websites dedicated to the rural subjects. The examples from the interview records with chairwomen of rural women's organizations from Podkarpackie Region were presented in the part of this article, which concerns descriptions of their current activities[1].

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[1] The following article is a part of a master's thesis written in 2010 at the University of Warsaw under the supervision of dr hab. Agnieszka Rothert. This master's thesis contains the description of changes in the rural women's movement in Poland since establishing the first organizations.

While discussing changes that occurred in the rural women's movement, it is necessary to present the most important factors determining their activity. Firstly, the distinction within the rural women's movement itself should be made. It is a social movement which, at the same time, is one of the tendencies in women's movement in general [Ślęczka 1999, Fuszara 2007]. The rural women's activity is a social activity or, in other words, a civic activity. It can be defined as a sphere of public life reflected in various organizational and legal forms. People acting in this sphere achieve various goals through organizational forms suggested by them [Szustek 2009].

RURAL WOMEN'S SOCIAL AND PROFESSIONAL SITUATION

In spite of the fact that social family patterns have changed over the last two decades and although the relations between spouses are more and more often based on partnership and the education of women lasts longer, it is difficult for them to be a full-time employee outside the farm. Moreover, women take care of their children and other dependents (e.g. of the elder and disabled family members) [Sawicka 2005]. According to J. Sawicka, the women's position is still influenced by the following factors: education, profession and income. At the same time she pays attention to the fact that "most rural women do not match the traditional image of a rural woman because they make a considerable contribution to the family business" [Sawicka 2005].

On the other hand, there still exists a division of activities that remain a women's domain and those reserved for men. There are two categories of decisions made in rural families: the first ones concern the agricultural production while the other apply to organization of family life and running a household. This distinction suggests that the tasks are divided into male and female ones. For instance, women usually do not interfere in planning the field works since they consider them to be men's domain. It means they withdraw from this area. However they would like to influence the decisions concerning the household budget more often and therefore credit and commercial agreements are negotiated and entered into by both spouses [Kurek 2006]. Thanks to these gradual changes, the relations in rural families are more often based on partnership. The additional factor supporting the transformation of these relations is taking up a job by women outside the household. By doing so their earnings contribute to family income [Kurek 2006].

The approach to the need for rural women's education is also changing. Education is perceived as a chance of development and self-realization. The rural women's educational level is increasing particularly among young women. Nevertheless, rural women are still worse educated in comparison with inhabitants of towns. In 2005 only 3.7% out of all female members of families running a farm who attained the age of 13, received higher education. In the same group 46.2% of women received secondary or post-secondary education. The educational level of the inhabitants of Polish villages considerably increased in comparison with the results of the Agricultural Census conducted in 1996 [Kurek 2006].

As a rule, rural women undertake lower-risk actions which do not require professional knowledge, e.g. they run farm tourism businesses. In order to encourage women to be more active, various attempts are made not only through the actions of state officials and non-governmental organizations providing the information on development possibilities, but also through mass media and TV series in particular [Michalska-Żyła 2008].

INTERNATIONAL CONTEXT

While considering the issue of the women's movement among the inhabitants of Polish villages, this phenomenon cannot be perceived as separated from the international context. It is crucial especially for the reason that some money which rural women's organizations and other organizations acting for rural women receive, come from the budgets of international organizations. In case of Poland, nowadays most financial resources come from the European Union budget. Additionally these organizations encourage rural women to undertake activities supporting improvement of their social and professional situation.

The international context can be divided into two areas. The first one constitute international women's organizations and international organizations for which the issue of rural women becomes one of the aspect of their activity. The first group includes the Associated Country Women of the World (ACWW) and the International Federation for Home Economics (IFHE).

The second group includes the United Nations Organization and the European Union. The UN undertakes the activity for rural women through the Food and Agriculture Organization of the UN (FAO). The European Union, within the scope of the Common Agricultural Policy (CAP), undertakes actions for improvement of the rural women's situation and social activation. The principle of gender mainstreaming (gender equality policy) is implemented within CAP; and also it was included into all common policies in the 1990s. The principles of equal treatment of women and men should be taken into account on every stage of the Rural Development Programme's implementation for 2007–2013[2]. It concerns among other things professional trainings for persons employed in agriculture and forestry, founding micro enterprises and their development as well as the Leader approach.

The Leader program very popular in European rural communities is a territorial, integrated, bottom-up, innovative approach based on partnership. It assumes the local funding arrangements and management as well as supports creating network of organizations involved in implementing the activities within the scope of this program [Gierulska, Augustynowicz 2009]. It also consists in cooperation of the representatives of three sectors: public, economic and social. And the center percentage of women members should be included. The representatives of the sectors mentioned above create the local action groups (LAG) which work out the local development strategies (LDS) as well as are responsible for implementation of the aims suggested therein taking into consideration the guidelines of the Leader approach. The aim of the Leader program is "the activation of the rural areas inhabitants by creating the social potential in the countryside, increasing the potential of financial resources acquisition and taking advantage of them, management improvement of local resources and their indexation" [Rural Development Programme 2007–2013].

There also exist the European Union universal relief program for all the inhabitants of the EU: cohesion policy, in particular the European Social Fund (ESF) which finances Human Capital Operational Programme.

[2] Rural Development Programme is a strategic document. Each EU member state prepares its own document which reflects the guidelines of the EU CAP. It is implemented during appropriate EU budget period [Szumski 2007].

NOWADAYS SOCIAL ACTIVITY OF RURAL WOMEN IN POLAND

Rural women undertake social activity for local environment more willingly than men or women living in towns. Moreover, they become councilors, chairs of village councils and take part in creating local activity groups.[Psyk-Piotrowska 2008]

The increase of rural woman's social activity is connected with Poland's accession to the European Union. It is the result of necessity to institutionalize the cooperation of public, economic and social sector. Therefore various trainings, workshops, conferences are organized and the principles how to finance the activities and control finances are established [Fuszara 2008]. The organizations wishing to undertake such an activity must have a legal personality. This phenomenon may also be considered in the context of changes in the Polish women's movement in general. The issue of qualitative changes in the Polish women's movement resulting from the accession of Poland to the European Union was taken up by M. Fuszara who claimed that rural women's organizations, which are active nowadays, are the organizations of women, not only for women [Fuszara 2007].

The most widespread rural women's activity is the activity in village women's clubs, which are, by definition, "voluntary, self-governed, independent, apolitical, social and professional organizations of rural women" [Grzebisz-Nowicka 1999]. The village women's clubs are treated by the act of 1982 as the organizational units of agricultural circles. Therefore they have never been and are not independent organizations.

Some of village women's clubs functioning on the basis of the act of 1982 on social-professional organizations of farmers evolve into associations which function on the basis of the act of April 7th, 1989 The Associations Act [the Journal of Laws of the Republic of Poland of 1989 No. 20 item 104 as amended]. Additionally they would like to obtain the status of public benefit organization which means they have to comply with the provisions of the act of April 24th , 2003 on Public Benefit and Volunteer Work [the Journal of Laws of the Republic of Poland of 2003, No. 96 item 873 as amended] [Raszeja-Ossowska, *Formalno-prawne...* 2010].

There are various organizational forms of village women's clubs which function nowadays: village women's club functioning as organizational entity of a farming circle, as an independent farming circle, as an association (ordinary or registered) [Raszeja-Ossowska, *Źródła...* 2010]. Apart from the types of rural women's organizations mentioned above, the new associations of women also come into being. They conduct similar activity to the activity of the organizations described above.

Having a legal personality enables participation in competitions for projects implemented within the scope of activities financed from the European Union's budget with participation of state financial resources (including the Leader program) as well as applying for grants from non-governmental organizations and local government authorities. Maria Majocha, the president of the Association Village Women's Club "Osada" in Otałęż in Podkarpackie Region, suggested such a solution for the organization she led: "As a result of transformation of the village women's club into an association we are able apply for money necessary to implement various projects. Thanks to the registration, the organization has an entry in the National Court Register and National Business Registry Number (REGON). Without them we could not apply for money from the EU. It is also easier to apply for grants from various organizations and subsidies from the communal budget" [Interview 2].

Rural women are also active in local organizations aims of which are not directly related to subject matter and women's movement. They join the activity of such organizations as voluntary fire brigades, rural sports clubs, church organizations, youth organizations as well as parents' councils functioning near schools. The village councils also constitute significant part of civic life [Kamiński 2009]. In connection with the Poland's accession to the European Union the new social organizations are being established in the rural areas. They belong to a non-governmental organizations sector. Acting as associations or foundations, these organizations run schools, propagate natural and cultural heritage of the region they inhabit. These communities try to adapt to changing living conditions in the country through such an activity [Kamiński 2009]. According to R. Śpiewak, apart from the accession of Poland to the EU, the development of civic society constitutes the additional factor which supports the growth of non-governmental organizations in the country [Śpiewak 2008].

M. Halamska's opinion is that the organizations mentioned above can be characterized by the following features: "focused to the center, without base or support in the area. She thinks that it is difficult to describe them as fully civic organizations: "… in the social reality they have all the features of "appearance" and "façade" which are legitimized by the law and state subsidies" [Halamska 2008]. During the interviews with rural activists I became convinced that one of main incentives for establishment of their associations or for transformation was the possibility to take advantage of various ways in which their activity can be financed. As far as I am concerned, the money constitutes for them rather an instrument which enables them to achieve the goals they set, not an aim in itself.

R. Kamiński is of the opinion that "there is no point in dividing them [i.e. organizations] into "better", "worse", "old" and "new". There are the inhabitants who verify how they functioning" [Kamiński 2009]. Changes in the rural women's activity in their organizations may be analyzed with reference to their membership in the local activity groups (LAG) which are responsible for implementation of local development strategies prepared within the scope of the Leader approach. This initiative has been implemented in Poland since 2004 (EU budget programming period 2000–2006). Seventy out of 150 existing groups were analyzed in terms of the membership in LAG. It turned out that only 10 typical women's organizations, including first of all village women's clubs, belonged to the local groups [Śpiewak 2009]. A similar analysis was conducted in 2009. There were 110 LAG taken into account, which constituted 30% of all LAG existing currently in Poland and chosen to implement the local strategies for the period 2007–2013 they prepared. It was reported that women's organizations were involved into 22 LAG [Ściański, Żak 2009]. The increase of women's involvement in the activity for local communities can be noticed while comparing both programming periods.

Being active, women count on the support of local government authorities. The relations between local government authorities and organizations are of a different character. Sometimes these organizations may count on support in the form of grants for a trip or an event organization [Desperat 2008]. However, there are also other situations. This cooperation does not only concern the implementations of projects requiring financial resources, but also consists in planning, information exchange, negotiating various undertakings and participation in committees [Śpiewak 2008]. I asked my interviewees about the cooperation with local government authorities. Each of them emphasized, that such a cooperation played a very significant role in functioning of the associations they

led. Many members of these organizations are also active in the local government authorities, mainly at commune (gmina) level. However, this cooperation is not always the way the non-governmental organizations wished for [Śpiewak 2008]. Anna Wójcicka, the president of the Women's Association "Victoria" from Górki in Podkarpackie Region complained about the issue of cooperation with local government authorities: "There were no greater difficulties [as regards the establishment of the association] but as usual, everything depended on people, precisely on these people who decided on the existence of our association. At the beginning of our way to register the association, the commune head gave us to understand that our ideas probably resulted from the lack of much serious things to do. (…) It was the district authorities, precisely the department of regional promotion which functions by the district authorities, that helped us the most. The employees of this department willingly provide all the non-governmental organizations with information, organize workshops and trips for us, inform of competitions" [Interview 1].

As a result of *the Diagnosis of the Social and Professional Situation of Rural Women in Poland* conducted in 2008, it was determined that the village women's clubs are the organizations that commune authorities cooperate with the most often (67% of indications). This cooperation is formal as well as informal. The communes cooperate also with the district authorities and they in turn implement, within the scope of their powers, the activities based on partnership with non-governmental organizations (NGOs). The partnership between the NGOs and the district authorities is stronger than the partnership at commune level. The cooperation between local government authorities and organizations mentioned above is of a great importance with a view to organizational help, material and financial support from commune and district authorities. It must be emphasized that this cooperation is not permanent. The local government authorities usually cooperate within the scope defined by the provisions of law [Marks 2008]. The recipients of the cooperation for rural women described above were asked for the opinion. It turned out that only 17% of women researched, investigated were satisfied with such a cooperation.

They listed also the most important aims for women's organizations nowadays: counteraction to violence in rural family (70%), counteraction to discrimination on the job market (42%), support for professional activity of rural women (35%), support for access to education for rural women (30%), counteraction to sexual harassment of rural women (27%), support for rural women's entrepreneurship (26%), promoting the pattern of rural family based on partnership (16%), support for social and civic activity of rural women (14%) [Walczak-Duraj 2008].

The representatives of the local government authorities and local organizations indicated the following problems of rural women: access to education and information, health protection, material conditions, job, family, infrastructure, rural women's personal features, social relations in the villages and small towns [Lisek-Michalska 2008].

Discussing the activity of rural women which brings them closer to solving the problems mentioned above, I will compare it to the activities undertaken by such organizations as village women's clubs and women's associations. The issue of activity of rural women cooperating with the Polish Women League will not be discussed. The description of rural women's activity was based on the comparison of their organizations' way of acting presented in Table 1 and supported by additional examples from the interviews conducted with the representatives of rural women's organizations.

Table 1. Comparison of rural women's activity within the scope of their organizations*
Tabela 1. Zestawienie działań podejmowanych przez kobiety wiejskie w ramach ich organizacji

Rural women's activity		
Type of activity performed		Occurrence in analyzed organizations
Events organization (harvest festivals, fests, feast, trips organized to celebrate Women's Day, Children's Day, Mother's Day, Senior's Day etc.)		35
Preparation of traditional dishes		22
Manufacturing traditional ornaments, craftsmanship, regional art		17
Participation in competitions (for preparation of festive decoration, dish preparation, art reviews, e.g. cabaret contests of rural women's club)		13
Own cabaret, music group, theater group		11
Implementation of financial products financed by the EU (Leader, Human Capital, village revival)		11
Participation in regional promotion during:	events in Poland	7
	events and trade fairs abroad	2
Cooperation with other non-governmental organizations in the village (Voluntary Fire Brigades, organizations for village development)		8
Study visit, cooperation with women's organizations		7
Charity (support for the Great Orchestra of Christmas Charity, ill children, purchase of a mammograph)		6
Participation in workshops, courses, lectures (on cuisine, hairdressing, cosmetology)		6
Activity for children and teenagers (equalization of educational chances, workshops)		5
Strengthening of women's entrepreneurship and personal development		5
Propagating prevention checkups		4
Local development, improving image of a region, activities for regional tourism development		4
Development of inhabitants' social activity		4
Preventing small schools from closing, running such schools		3
Organizing exhibitions, memory chambers		3
Organizing social free of charge kindergarten		2
Releasing publications, local newspapers, brochures		2
Activity for elder people		2
Activity for disabled people		2
International cooperation		1

*The data presented in the table were collected on the basis of analysis of 53 women's organizations' characteristics available on website "kobietynawsi.pl". A substantial majority perceives themselves as village women's clubs, the remaining ones are the associations. While analyzing the data presented in the table, it should be taken into account that most of them act in Zachodniopomorskie Region. Thus it is possible that some indications are not reflected in other regions of Poland.

Source: The author's analysis on the basis of characteristics of 53 rural woman organizations presented on website www.kobietynawsi.pl.

Źródło: Opracowanie własne na podstawie charakterystyki 53 organizacji kobiecych na wsi, przedstawionej w portalu: www.kobietynawsi.pl.

The proportions between undertaken activities are changing. Some of the village women's clubs' functions, ones basic, are not implemented any more, for instance distribution of nestlings, seedlings, seeds, the presentation of hygiene principles or running the model households. They nowadays rarely rent dishes or household appliances but more often organize various events, trips and take part in study tours. The most often listed aims, implemented by these organizations, include participating in region promotion and tourism development. It concerns the preparation of local regional food dishes, performance of handicrafts with ornamentation typical for the region with the use of traditional techniques. The establishment of music, theatrical groups and cabarets should also be taken into consideration. Both village women's clubs and rural women's associations participate in the improvement of the country image through cleaning up the area and establishment of parks and playgrounds. There are also workshops and professional courses organized.

Maria Majocha from the Association "Osada" in Otałęż, which implements projects financed from the resources of the Leader program, lists the examples of such activities: "We, the association, managed to establish a playground for children next to the firehouse. We also try to influence the improvement of the our village's image. For instance, we supported the proposal to build the sewage system and we succeeded." [Interview 2]. The women's organizations attempt to keep in their villages small schools, which the authorities intended to close. These organizations sometimes run free of charge, social kindergartens. Apart from the activity for children and teenagers, the rural women's organizations also support elder and disabled people. Various collections of money for charities are also organized. For instance, the Association "Gracja" was engaged in two campaigns: "We collected money for a girl ill with leukemia. Before our theater's performance we announced a spontaneous collection for rehabilitation of a girl from neighboring village who had an accident on her way to work" [Interview 3]. Six out of 53 organizations taken into account in the following comparison conducted charitable activities. They helped ill children, supported the purchase of a mammograph, organized collections for the Great Orchestra of Christmas Charity[3].

It is worth emphasizing that rural activists are very business oriented. Apart from the fact that they know how and where to apply for financial support, they are able to earn money – they sell groceries they prepared, but also doilies, tablecloths and other products. "We also can earn money, but these sums are not very big. However it is enough to cover the costs of our activity. For example we can sell our products on fairs and fests. We managed to earn about 1000 PLN on one of such trade fests. Moreover, we prepared food for 60 people during street art festival organized by the Association J'ARTE from

[3] The Great Orchestra of Christmas Charity is a Polish foundation, whose aim consists in working in the field of health protection by saving patients' and especially young patients' life as well as supporting their treatment. Additionally, the Foundation promotes health and medical prevention. It pursues this aim by organizing the annual money collections, by purchasing medical equipment for Polish hospitals and by running five nation-wide medical programs and one educational program. [http://www.en.wosp.org.pl/foundation#What_do_we_do_]

Mielec last year, which also significantly contributed to our budget", emphasizes Józefa Śpiewak [Interview 3].

The women's organizations also support their candidates for chairs of the village councils (sołtys), councilors and representatives of commune authorities. It happens in associations led by my interviewees from Podkarpacie Region – among their members there are chairs of the village councils, councilors, representatives of commune authorities. A similar situation takes place in a village located near Bydgoszcz. Elżbieta Saj is the chairperson of the village council (sołtys) and the head of village women's club. "There are a dozen or so women in the club at present. The youngest one is about twenty, the eldest – in her fifties. It is us who control the village. Admittedly, I am the chair of the village council, but of course all the decisions are made by the club.", she says [Iwanciw, Lewińska 2010].

The women conducting their activity in the villages located far from metropolitan areas complain that the distance to administrative centers is too long. For this reason they concentrate mainly on the local activities. "We cooperate with women's associations from our nearest neighborhood. We do not have formalized projects. Our common actions are based, for example, on organizing common trips and courses. We have visited the villages where the befriended organizations act and we presented our theater performance there" [Interview 3]. Maria Majocha from the Association "Osada" particularly appreciates cooperation at the district forum: "Most often we cooperate within the area of our district. (...) We also appreciate cooperation with "PROWENT" Local Action Group [Interview 2].

It follows from the picture of rural women's social activity presented above that this process had a positive influence on organizations as well as on women who conduct their activity more and more boldly and try to influence the inhabitants of their villages. It cannot be said that the rural women's mentality changed markedly since they remain very conservative in moral sphere. However they are aware of their value and perceive being a woman as a huge advantage.

CONCLUSIONS

The attitude of rural women towards the roles they fulfill has changed under the influence of social changes and strengthening role of the women's movement. Once having been dependent on men, they become independent and are active in various organizations now. Of course it does not mean that they do not take into account their husbands' opinions but they treat them rather as advisors. Since women fulfill many various roles, they are able to organize their lives in a better way and find time for social activity. In spite of all changes that occurred in the country, there still exists the division into activities performed by men and women. Crucial is the fact that over the last years the organizations of rural women have become the organizations of women, not only for women. It means that they are established and fully led by women and that women are able to make use of all accessible possibilities.

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Interview 3 with Józefa Śpiewak – the president of the Women' Association "Gracja" in Czermin, 16 May 2010.

ZMIANY W RUCHU KOBIET WIEJSKICH W ZWIĄZKU Z PRZYSTĄPIENIEM POLSKI DO UNII EUROPEJSKIEJ

Streszczenie. Przystąpienie Polski do UE w 2004 roku, jak również przygotowania do akcesji pozytywnie wpłynęły na zmiany, jakie zaistniały na wsi. Jest to szczególnie widoczne w odniesieniu do ruchu kobiet wiejskich, które prowadząc działalność społeczną, realizują projekty finansowane między innymi z funduszy europejskich, zarówno na rzecz kobiet, jak również społeczności lokalnych. Współpracują przy tym z władzami lokalnymi. Emancypacja kobiet wiejskich przebiega jednak nieco inaczej niż w przypadku kobiet mieszkających w miastach. Kobiety wiejskie pozostając bardzo konserwatywnymi w sferze obyczajowej, mają świadomość zmian społecznych i dostrzegają możliwości rozwoju osobistego. Praca społeczna jest dla nich dodatkowym zajęciem. Warto podkreślić, że najważniejsza zmiana w ruchu kobiet wiejskich w ostatnich latach polega na usamodzielnieniu się organizacji kobiecych.

Słowa kluczowe: kobieta, ruch kobiet, ruch kobiet wiejskich, koło gospodyń wiejskich, stowarzyszenie, działalność społeczna, Unia Europejska, Polska

Accepted for print – Zaakceptowano do druku 27.01.2011

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