Classification of Agri-Tourism / Rural Tourism SMEs in Poland (on the Example of the Wielkopolska Region)

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Abstract

The paper is based on data from a questionnaire survey (interviews) conducted in the western part of Poland on 183 rural tourism and agri-tourism small and medium enterprises. The classification of enterprises was based on the methodology proposed by Wysocki (1996) and included the k-means clustering algorithm. As the result of the research three types of SMEs were separated, including the top resilient enterprises aimed mainly at tourism activity and usually connected with horse recreation, a cluster of mixed SMEs for which tourism activity was an additional and less important source of income, and a group of SMEs for which tourism activity was an additional but important source of income. The classification may be used as a hint for rural development policy makers for future support of rural tourism / agri-tourism development.

Key Words

Agri-tourism, rural tourism, SMEs, Rural development, Poland, Q12.

Introduction

Rural areas used to be dependent on farming and income from agricultural production was the base of maintenance for large part of rural population for many centuries. However the primary sectors (agriculture, fishing, and forestry) has changed and the rural economy became multifunctional, especially in the most developed countries (Mahé&Ortalo-Magné, 1999; Givord 2000/2001). The Europe is 44 per cent farmland and including the other areas maintained by farmers in the countryside (i.e. wooded areas, natural areas, buildings and infrastructure) one can say that half of the territory of the Continent is managed by farmers (Statistics in Focus: Agriculture, 1998). Regardless different definitions of rural areas and rurality major part of Europe is rural and major population of Europe still lives in rural areas. However only a part of rural citizens used to be farmers. Within farming itself, farmers can increasingly be regarded as 'rural entrepreneurs' who produce a whole range of goods in addition to agricultural commodities and provide a range variety of services (Rural Developments CAP 2000, 1997). Consequently there is a strong link between agriculture, rurality and territory, but agriculture more and more contributes to the preservation, maintenance and development of landscapes. Furthermore rural infrastructure, including landscape and heritage are increasingly fulfilling recreational and tourism purposes (Givord, 2000/2001). Tourism is an avenue to achieve employment, income generation, and economic stability while providing new uses for older facilities and often providing a focal point for community. However tourism opportunities must be well planned to balance social and environmental costs with economic benefits activity (Tourism Strategies for Rural Development, 1993). Therefore tourism development become an area of interest both rural and agricultural as well as tourism policy of many countries, including the EU, and has been strongly supported by them (Jouen 2000/2001). The best proof of it is the increasing amount of the European Union funds spent on various programmes and project benefiting the rural areas (between EUR 4,300 and 4,370 million will be allocated each year to rural development and accompanying measures during the period 2000-2006, including Structural Funds, e.g. the LEADER+ Community Initiative as well as Pre-Accession Funds for the new EU member countries, like PHARE, SAPARD, and ISPA).Common Rural Policy expenditures, namely Structural Funds together with Common Agricultural Policy expenditures, constitute over two thirds of the whole EU budget. The new EU member states of Central Europe have also been introducing multifunctional rural development programmes, including actions aimed at diversification of rural areas, increasing employment possibilities for rural inhabitants, developing rural infrastructure supporting establishment of small and medium size enterprises (SMEs) (National Programme of Preparation for Membership in the European Union: Poland, 1999). The importance of small-scale entrepreneurship has increased in rural areas and small-scale tourism is intuitively perceived as a suitable form of economic development for rural and agricultural population. Increasingly rural communities of different countries are seeking to utilise recreation, tourism, and tourism related activities to diversify their economies and to replace traditional agriculture related industries which have been obsolete or have left the community (Butler, 1998). On the other hand, for CEE countries tourism is also seen as an avenue to achieve employment, income generation, and economic stability while providing new uses for older facilities and often providing a focal point for community activity. In some countries rural tourism and agri-tourism are

well developed and there are a lot of farms that benefit even over 50 per cent of income from the activity. However Kaila's (1999) pointed out that the profitability of plur-active farm enterprises can be weaker then of traditional farms, but the off-farm income diversification can be used to decrease annual income variation (Kaila, 1999; Mahé & Ortalo-Magné, 1999). Tourism, like no other area of the economy, creates the possibility of enhancing farm income and leads to improvement of living and working conditions of rural population, but sustainable tourism development aimed at keeping a balance between the needs of visitors, the environment and the host community for current as well as future generations (Sustainable Tourism and Nature, 2000), must be supported at national, regional and local level not only by special developmental policies and strategies but also financially. The only question is: to support all SMEs providing tourist services or only some of them and which? Suitable classification of rural tourism SMEs based on their financial condition, sources of income and level of their income can be some kind of advice for rural policy makers.

'Agritourism' and 'rural tourism' are terms requiring some explanations. 'Agri-tourism' refers to all tourism and recreation activities connected with a working farm or any agricultural, horticultural, fishery or agribusiness operation (is equivalent to farm-based tourism or farm tourism). 'Rural tourism' can be defined as a multifaceted tourism / recreation activity that takes place in an environment outside heavily urbanised areas (within rural areas, countryside), but excluding agri-tourism. Following Lane (1994) rural tourism should be „located in rural areas, (...) functionally rural, (...) rural in scale i.e. usually small-scale, (...) traditional in character, growing slowly and organically, connected with local families, (...) representing the complex pattern of rural environment, economy, history and location". However the concept of rural tourism is slightly different than definition used by Lane (1994) who includes farm-based tourism within rural tourism. In fact in literature there is a great variety and different meaning of terminology and defining tourism in rural areas seems to be complex (Greffe, 1992; Lane, 1994; Warren & Taylor, 1999; Hegarty & Ruddy, 2001; Roberts & Hall, 2001).

One can easily find various tourism products and even rural tourism classification in literature (e.g. Danman i Koščak, 1993; Greffe, 1994; Lane, 1994; Altkorn, 1995; Hall & Page, 1999 etc.), but usually they are based on form of accommodation or provided services. For some purposes more suitable seems to be farm classification that can be adapted for agri-tourism farms or rural tourism enterprises classification, proposed by Woś (1996) or Jóźwiak (1998). Both of them consider agricultural farms diversification according to their social-economic situation and their future possibilities of development. For example Woś (1996) suggested dividing the whole population of farms into the following: developmental (growing), traditional farms capable to further development, and un-developmental and falling down farms. Classification proposed by Jóźwiak (1998) regards their future developmental strategies. Both classifications can be only a clue for tourism SMEs typology. Despite various surveys concerning different populations of rural small and medium enterprises providing tourism services hard to find a classification based on their structure of income or similar economic-financial situation. Hence the survey aimed at identification of rural tourism / agri-tourism small and medium enterprises according to chosen variables describing their sources of income and factors influencing the level of income, and in particular income from farming and tourism activity. The survey is based on data from the western part of Poland, namely the Wielkopolska region.

Wielkopolska is a big province in western Poland regarded as an agricultural-industrial region. Development of tourism activities in rural areas has accelerated in the nineties and it was a result of introducing market economy and restructuring Polish agricultural sector. In the paper a term 'province' is used alternatively to 'region'. Since 1999 Poland has been divided into 16 large provinces ('województwo') relating to NUTS 2 level instead of 49 previous small provinces. NUTS (Nomenclature des Unités Territoriales Statistiques), i.e. the Nomenclature of Territorial Units for Statistics introduced by EUROOSTAT, comprise three regional levels: NUTS 1 - the Member States, total area of the countries, NUTS 2 - large regions like the "Régions" in Belgium or the "Länder" in Germany (in Poland – province, i.e. 'województwo'), NUTS 3 – under-regions equivalent to, e.g. the "Regioni" in Italy or the "Comunidades autonomas" in Spain (in Poland - district, i.e. 'powiat') as well as two local levels: NUTS 4 level - the French "départements" and the Swedish "Län" NUTS (in Poland – cities, 'miasta na prawach powiatu') and NUTS 5 - local municipalities or communes (in Poland – community, i.e. 'gmina') (Rural Developments CAP 2000, 1997).

Large part of the Wielkopolska region seems to be favourable for rural tourism development, however tourism services (including agri-tourism and rural tourism) are not well developed yet and the region is not the traditional tourist destination. There are about 450 small scale tourism enterprises in rural areas of the region connected with agricultural farms and rural households.

Data Sources and Empirical Methodology

The paper results from a questionnaire survey (interviews) conducted in the western part of Poland (the Wielkopolska province). The study focused on regional diversification of agri-tourism and rural tourism SMEs, including links between tourism and agriculture, the influence of tourism activities on farming and vice versa as well as agri-tourism and rural tourism SMEs enterprises' financial situation. Upon the data collected during the survey all the enterprises were classified by their income status with reference to a level and a relation between income from farming and tourism activity as well as factors influencing the level and the structure of the income.

In the first stage of the study, 232 rural tourism / agri-tourism small and medium enterprises of the Wielkopolska region were identified, however 183 consented to participate in the survey (78.9 per cent of the total number). There was a prerequisite in survey that rural tourism and agri-tourism SMEs must have started their activity before 2000. The SMEs were interviewed using a standardised questionnaire survey. Geographic distribution of rural tourism and agri-tourism enterprises across the Wielkopolska province was very uneven. The greater concentration of rural tourism and agri-tourism activities were observed in the western and north-western areas of the region, where conditions for tourism development in rural areas seemed to be the most favourable.

Classification of the identified SMEs was the second stage of the survey. The classification of enterprises was based on the methodology proposed by Wysocki (1996) and included k-means cluster analysis. The aim of the clustering analysis is to find relatively homogenous clusters of multi-feature cases (enterprises) that each of them can be treated as a point in multidimensional space of features. The cases should be spread out into homogenous G clusters where $1<G<N$ as the cases in the same cluster were in geometrical sense more similar to each other than to the cases from the other clusters (Wysocki, 1996 following Mandel, 1988, Bratchell, 1989, and Rozin, 1979).

There is a great number of clustering methods, including two essential groups: hierarchical and non-hierarchical ones (Wysocki, 1996). The hierarchical methods consist in computing the proximities between cases by the chosen measure of proximity and next their gradual assignment into new clusters of cluster pairs where the proximity between each other is the smallest (Jajuga, 1993). There are two important disadvantages of hierarchical methods. The former is limited number of analysed cases (even using computer analysis number of cases usually should not exceed 200, because there may be essential limitations suspending calculation process) and the latter is an issue of the clusters (types) number determination. The k-means clustering algorithm (analysis) applied in the survey belongs to the group of non-hierarchical methods (Wysocki, 1996 following Mac Queen, 1967; comparable to Grabiński et al., 1989). Non-hierarchical methods, including the k-means analysis, initially take the number of components of the population equal to the final required number of clusters. In this step itself the final required number of clusters is chosen such that the points are mutually farthest apart. The idea of the k-means analysis, elaborated by Dalenius in the 1950th (Dalenius, 1950; Dalenius & Gurney, 1951), consists of clustering population of cases into k-clusters to minimize its inner-cluster variance and to maximize between cluster variance (comparable to Grabiński et al., 1989).

The classification comprised the following stages:

1. determination of a set of variables describing the surveyed enterprises by their economical-financial state,
2. selection of the required number of clusters of surveyed enterprises,
3. classification of the enterprises using the determined variables,
4. description of clusters of enterprises obtained in the k-means procedure.

The procedure of enterprises' classification is preceded by determination of a set of P variables which describe economical and financial state of the N enterprises the best, including their results both from farming and tourism activities. The chosen variables create a collection of data determined as (N x P) multivariate matrix of R data.

Such matrix is a starting point for classification. At this stage it is important to eliminate variables which are excessively correlated with each other. The procedure of elimination of the variables is as following: on the basis of calculated correlation matrix R, one establishes an inverse matrix $R^{-1} = (r^{(ij)})$ where $r^{(ij)}$ (i,j=1,2,...,k) are the elements of the inverse matrix R^{-1}. The diagonal element $r^{(ij)}$ has values from the interval (1,+∞). When a variable is excessively correlated with the others diagonal components of the inverse matrix R^{-1} are much bigger than 10 what means wrong numerical condition of the matrix R.

The initial stage of the k-means cluster analysis consists in transformation of the data matrix (R) by standardisation of the variables following the formula:

$$z_{ij} = \frac{x_{ij} - \overline{x}_j}{s_j}, \quad i=1,2,...,n;\ j=1,2,...,p \qquad \text{Equation (1).}$$

where:

z_{ij} - standardised value j variable for i unit (enterprise),

x_{ij} - value of j variable for i unit (enterprise),

$\overline{x}_j$ - mean value of j variable,

s_j - standard deviation of p variable.

Standardised values of the variables set in the (N x P) dimensional Z matrix are the starting point for classification of enterprises (e.g. with regard to their financial situation).

Calculations begin with establishing k random clusters. Then each examined component (case) is assigned to one cluster to minimize variability inside the cluster and to maximize variability between the clusters. In literature there are different proposals of choosing the most proper number of clusters from the computed clusters of the surveyed population (e.g. Wysocki, 1996; Woś, 1996; Jóźwiak, 1998).

General outline of the k-means analysis procedure can be described in the following points (Grabiński et al., 1989):

1. The maximum number of *I* iterations and the number of *k* clusters that the analysed population is to be divided are established, regarding $k \in < 2, n-1 >$, where n is the number of objects.
2. Then an initial matrix of clusters' centroids is established:

$$B = [b_{tj}], \text{ where } t=1,2,...,k;\ j=1,2,...,m \qquad \text{Equation (2).}$$

   where *m* is the number of variables; then individual object are being assigned to such a cluster where the distance between the objects and the centroid of a certain group is the smallest.
3. Next a value of the initial error of the objects' intervals between *k* clusters is set up:

$$e = \sum_{i=1}^{n} d_{it}^2 \qquad \text{Equation (3).}$$

   where d_{it} is the Euclidean distance between the *i* object and the nearest *t* centroid:

$$d_{it}^2 = \sum_{j=1}^{m} (x_{ij} - b_{tj})^2 \qquad \text{where } i=1,2,...,n \qquad \text{Equation (4).}$$

4. For the first object one must define changes of the classification error resulting from it successive including in all currently existing clusters:

$$\Delta e_t^{(1)} = \frac{n_t d_{1t}^2}{n_t + 1} - \frac{n_{t_1} d_{1t_1}^2}{n_{t_1} - 1}, \qquad \text{Equation (5).}$$

where:

n_t is a frequency of *t* group,

d_{1t}^2 - distance between the first object and the centroid of the *t* cluster,

n_{t_1} - size of the cluster containing the first object,

$d_{1t_1}^2$ - distance between the first object and the nearest centroid.

If the minimum value of the above expression for all $t \neq t_1$ is negative the first object must be included in the cluster for which $\Delta e_t^{(1)}$=min. Then the centroid of the B cluster is recalculated regarding the undertaken transformation of the object and current value of classification error is calculated according to the formula:

$$e = \sum_{i=1}^{n} d_{it}^2 \qquad \text{Equation (6).}$$

If the minimum value of the above expression is positive or equal zero no changes are done.

5. The described above actions are repeated to the end of the first iteration of the procedure.
6. If no displacement of objects from one cluster to another in a given iteration is observed the procedure ends. Otherwise the next iteration begins until the number of iterations does not exceed I value of clusters established at the beginning of the procedure.

Significance tests of the classification are done on the basis of the values of the F-test (Fisher-Snedecor) resulting from variance analysis conducted for each of the variables. The higher values of the F-test the more differentiated the identified clusters. Each cluster corresponds to one type of enterprises identified on the basis of their variables (features, attributes). Each cluster can be identified by comparison of the mean values of the clusters with corresponding means of the population or by analysis of the means differences in clusters and in the population (Wysocki, 1996). The k-means clustering algorithm is a part of SPSS (or STATISTICA) statistical software that was used for agri-tourism and rural tourism enterprises classification.

Primary Classification of Agri-Tourism and Rural Tourism Enterprises

The classification of the agri-tourism and rural tourism enterprises was based on the methodology proposed by Wysocki (1996) and included k-means cluster analysis. Initially three clusters (types) of similar structure of income (similar sources of maintenance) were proposed, including:

1. Active, resilient and dynamically developing agri-tourism or rural tourism enterprises making their living mainly from tourism activity;
2. Enterprises with mixed structure of income for which tourism activity was an important source of income;
3. Enterprises with mixed structure of income for which tourism income was less important or even unimportant.

Quantitative variables describing the examined enterprises by their size, number of permanent members and number of working persons, sources of maintenance, and agricultural production as well as tourism activity in particular were used for the k-means clustering typology.

There are very few precise classifications of agri-tourism and rural tourism enterprises in literature and none classification of agri-tourism and rural tourism small and medium enterprises by their income status (relation between income from farming and tourism activity) was found 19 measurable characteristics (variables) were chosen for the classification and they can be assigned into the following three groups (table 1.):

1. variables expressing income value both from farming and tourism activities (CPPV, CAPV, IT, STI),
2. variables determining level of income from tourism activity (AP, MP, NB, NV, LTS, MS),
3. other variables influencing the level of income both from tourism and farming activities (TA, SAL, AGE, PHM, FW, TW, OFW, TLE, EA).

Table 1. Description of variables used for classification of agri-tourism and rural tourism enterprises.

No	Symbol (code name)	Name of variable	Characteristics of variables
1	TA	Total area	hectares
2	SAL	Share of agricultural land in total area	per cent of total area
3	AGE	Average age of the owners of enterprises	years
4	PHM	Number of permanent household members	physical persons
5	FW	Number of persons working in farming (agricultural production)	physical persons
6	TW	Number of persons working in tourism activities	physical persons
7	OFW	Number of persons working off-farming	physical persons
8	TLE	Total labour expenditures in the enterprise	including labour expenditures both in farming and in tourism, in working hours per year per all working persons
9	MS	Number of maintenance sources	absolute numbers
10	NB	Number of beds	total number of beds per 1 enterprise, excluding camp sites
11	NV	Number of visitors	total number of visitors per year
12	LTS	Length of the tourism season	average number of days with visitors per year
13	EA	Rural tourism and agritourism enterprises age (length of activity)	number of years of tourism activity from the year of first visitors
14	AP	Accommodation price**	average price of accommodation per 1 person per day in Polish zloty
15	MP	Meal price**	average price of 1 dinner* per 1 person in Polish zloty
16	IT	Income from tourism activity**	total income from tourism activity in Polish zloty
17	CPPV	Commodity plant production value**	value in zloty per year
18	CAPV	Commodity animal production value**	value in zloty per year
19	STI	Share of income from tourism activity in total income	per cent value of the total income of a household

*Dinner was the meal the most often offered in the surveyed enterprises.
** at average 1USD was 3.968 Polish zloty.
Source: Own elaboration.

An outline description of the chosen variables is shown in the table 2. The chosen variables differentiated the examined enterprises what can be proved by a significant range between minimum and maximum values as well as variation coefficient values.

Table 2. Descriptive statistics of the variables used for classification of agri-tourism and rural tourism enterprises of the Wielkopolska region.

No	Variables (x_j)	Classical measures					Order statistics				
		min	$\bar{x}_j$	max	s_j	v_j (%)	Q_1	Me	Q_3	Q	A_s
1	TA	0.0	19.7	430.0	38.9	196.8	3.5	10.5	23.3	9.9	7.432
2	SAL	0.0	72.7	100.0	33.9	46.7	60.0	88.0	98.0	19.0	-1.262

3	AGE	21.0	45.4	73.0	9.4	20.6	40.0	45.0	51.0	5.5	0.043
4	PHM	0	3.7	8	1.7	44.7	3.0	4.0	5.0	1.0	0.280
5	FW	0	2.7	18	2.7	98.7	1.0	2.0	4.0	1.5	1.984
6	TW	0	2.4	7	1.3	54.4	1.0	2.0	3.0	1.0	0.841
7	OFW	0	0.8	3	0.8	103.7	0.0	1.0	1.0	0.5	0.685
8	TLE	0	5,050	101,192	7,945.2	157.3	1,710.0	3,960.0	6,831.0	2,560.5	9.869
9	MS	1	2.8	6	0.8	28.6	2.0	3.0	3.0	0.5	0.630
10	NB	0	10.3	46	7.0	67.5	6.0	8.0	12.0	3.0	2.080
11	NV	1	77.0	2000	197.1	256.2	15.0	35.0	60.0	22.5	6.943
12	LTS	3	97.2	365	76.2	78.3	50.0	90.0	120.0	35.0	1.861
13	EA	1	4.7	31	3.0	63.0	3.0	4.0	30	13.5	4.227
14	AP	3.5	28.5	310.0	31.9	112.0	15.0	20.0	30.0	7.5	5.104
15	MP	0.0	8.0	30.0	6.1	76.7	0.0	10.0	10.0	5.0	0.182
16	IT	120	14,393	400,000	40,357.5	280.4	3,000.0	5,000.0	10,000.0	3,500.0	6.790
17	CPPV	0	10,597	248,305	31,069.4	293.2	0.0	0.0	8,000.0	4,000.0	5.353
18	CAPV	0	23,383	600,001	55,633.3	237.9	0.0	501.0	27,503.0	13,751.5	6.884
19	STI	0.0	22.0	205.0	26.4	120.3	5.0	10.0	30.0	12.5	1.711

Explanations: min - minimum, $\overline{x}_j$- arithmetic mean, max - maximum, s_j – standard deviation, v_j- coefficient of variation, Q_1- lower quartile, Me - median, Q_3- upper quartile, Q- quartile deviation, A_s - skewness.

Source: Own elaboration based on the data from survey.

Among the chosen variables number of visitors (NV) and income from tourism activity and from faming were the most differentiated (CPPV and CAPV). The average variation of tourism activity income values was till 280.4 per cent of the mean value, 293.2 per cent for plant commodity production, and 237.9 per cent for animal commodity production. There were also quite significant differences in number visitors in the examined enterprises and the average variation coefficient amounted 256.2 per cent of the mean value. Among the other variables with very high coefficient of variation one can also mention total area of an enterprise (v_j=196.8 per cent) as well as total expenditure of labour both in farming and tourism activity (v_j=157.3 per cent).

Relatively low scatters, but enough to use in cluster analysis were characteristic of two variables: average age of the enterprises' owners AGE (v_j=20.6 per cent) and number of maintenance sources MS (v_j=28.6 per cent).

Results of the analysis of classical statistics were confirmed by analysis of the order statistics (table 6.). Most of calculated median values of the variables indicated significant variation in comparison to their mean values. Positive values of the skewness coefficient testified their right-sided asymmetry, excluding SAL variable which had explicit left-sided skewness as well as AGE, PHM, MP variables which skewness coefficients were approximated to zero and distribution of variables were approximated to symmetrical. The following variables: PO, TLE, NV, AP, IT, CPPV and CAPV indicated the maximum positive skewness (right-sided). The same variables had the highest values of variation coefficients.

Since the chosen variables had different denominations and represented differentiated dimension order they had to be normalised. The method of variable standardisation was used for unification of the chosen variables (Wysocki, 1996). Standardised values of the variables were set together in (N x P) multivariate Z matrix and in such a shape they were a starting point for classification of the examined enterprises with regard to their sources of maintenance (sources of income), including their income from tourism and farming activities in particular.

Results of Enterprises' Classification by the k-means Clustering Analysis

One of the most important steps is the final required number of cluster choice. According to suggestions of Wysocki (1996), Woś (1996), and Jóźwiak (1998) regarding the best choice of the number of clusters one proposed three cluster partition for the examined population of agri-tourism and rural tourism enterprises. The results of clustering were presented in the table 3. As expected three cluster partition proved to be the best one, but first 4, 5, and 6 cluster partitions had also been

examined. Nevertheless the dispersions of the points (cases) in them were unsatisfactory. Partition for 4, 5, and 6 clusters was examined but the results were unsatisfactory. The components of the population aggregated in the following clusters: 3, 176, 3 and 1 (4 clusters), 3, 63, 1, 2 and 114 (for 5 clusters), 2, 3, 63, 2, 1 and 112 (for 6 clusters). When the number of clusters was 4, 5 or 6, components from the smallest groups created new smaller ones but very few of cases moved between the bigger clusters. Finally, three clusters were obtained (table 3.).

Table 3. Results of classification of the surveyed population of agri-tourism and rural tourism enterprises of the Wielkopolska region.

No.	Types of enterprises	General characteristics of the types of enterprises	Number of enterprises	Percent of total
1	TYPE I	Enterprises aimed at tourism activity, with tourism activity as a main or exclusive source of maintenance.	6	3.3
2	TYPE II	Mixed enterprises for which tourism activity is an additional less important source of income.	117	63.9
3	TYPE III	Mixed enterprises for which tourism activity is an additional but important source of income.	60	32.8
4	TOTAL:	X	183	100.0

Source: Own elaboration.

The largest cluster was created by mixed income enterprises for which tourism activity was less important in their structure of income. The type II cluster comprised 117 from 183 examined enterprises that is 63.9 percent of the total number. The second biggest cluster was created by enterprises with mixed sources of maintenance for which tourism activity was an important source of income. The cluster marked as a type III was created by 60 enterprises, i.e. 32.8 per cent of the total number of enterprises. The third cluster contained 6 cases (enterprises), i.e. only 3.3 per cent of the total number of examined enterprises, and tourism activity was very important for their budgets, being the main or even the only source of income.

Table 4. Values of standardised class (type) means.

No	Variables	Standardised class means		
		TYPE I	TYPE II	TYPE III
1	PO	1.631	-0.009	-0.146
2	SAL	-0.123	0.434	-0.835
3	AGE	0.263	-0.156	0.279
4	PHM	-0.429	0.335	-0.610
5	FW	0.344	0.258	-0.538
6	TW	0.727	-0.154	0.227
7	OFW	-0.136	0.066	-0.115
8	TLE	0.438	0.008	-0.060
9	MS	-1.002	0.309	-0.503
10	NB	0.864	-0.247	0.395
11	NV	4.302	-0.232	0.023
12	LTS.	2.170	-0.285	0.339
13	EA	0.260	-0.227	0.416
14	AP	0.108	-0.241	0.459
15	MP	1.112	0.016	-0.142
16	IT	4.399	-0.237	0.022
17	CPPV	-0.179	0.143	-0.262
18	CAPV	0.052	0.133	-0.264
19	STI	2.384	-0.398	0.538

Source: Own elaboration based on the data and results of survey.

Table 4 contains standardised mean values of variables by separated three types of enterprises. Significant differentiation of mean values among the three types of enterprises was identified. Number of visitors (NV), income from tourism activity (IT) as well as the

share of tourism activity income in the total income of the enterprises (STI) were the variables which differentiated type I and types II and III the most. The other variables significantly differentiating the examined enterprises were as following: share of agricultural land in total area (SAL), number of permanent household members (PHM), number of persons working in farming (agricultural production) (FW), number of persons working in tourism activities (TW), number of maintenance sources (MS), and variables describing tourism activity, including number of beds (NB), length of the tourism season (LTS), rural tourism and agritourism enterprises age (length of activity) (EA) and accommodation price (AP). Among the first group of variables expressing income value of farming and tourism activities, STI (share of income from tourism activity in total income) was more differentiating variable than CPPV and CAPV (respectively commodity plant production value and commodity animal production value).

Two variables, namely total area (TA) and income from tourism activity (IT) differentiated explicitly type I enterprises from type II and III ones, but very slightly type II and III between each other.

On the other hand four variables, including: average age of the owners of enterprises (AGE), number of persons working off-farming (OFW) and total labour expenditures in the enterprise (TLE) and average meal price (MP) had a low capability of differentiation.

The calculated standardised arithmetic means of the separated three types of enterprises were ilustrated on the figure 1.

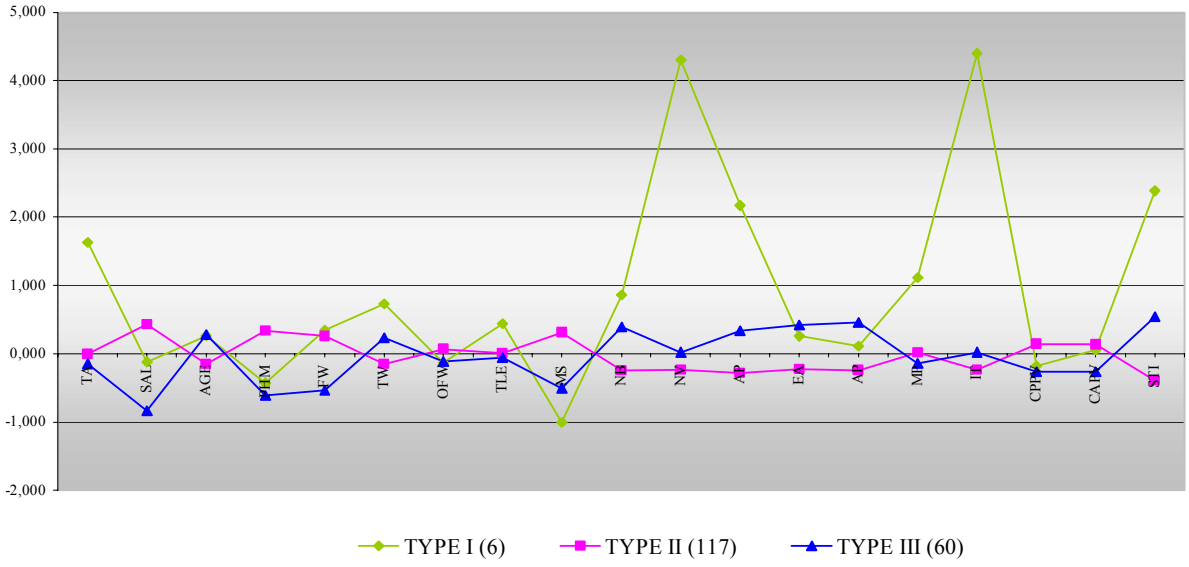

Figure 1. Values of standardised class means for separated typological classes.
There are numbers of enterprises included in each typology class in the brackets.
Source: Own elaboration based on data from table 6.

The F-test (Fisher-Snedecor) was used to verify H_0 hypothesis regarding non-variation of the standardised class means. The results of the test are shown in the table 5. Upon the values of the standardised class means one can find the chosen variables as statistically significant excluding two of them, namely OFW (number of persons working off-farming) and TLE (total labour expenditures in the enterprise). In case of the other variables there is no reason to accept the hypothesis of non-variation among the variable means. However H_0 hypothesis cannot be accepted for OFW and TLE variables that were statistically significant at the level of 0.495 and 0.505 respectively. Considering that fact the variables could not be accepted as discriminating the examined population of enterprises. Therefore the variables were omitted in the description of the separated three types (clusters) of agri-tourism and rural tourism enterprises.

Table 5. Statistical analysis of significance for standardised variables featuring surveyed agri-tourism and rural tourism enterprises of the Wielkopolska region.

No	Variables	Standardised class means for enterprises			Values of F statistics (*Fisher-Snedecor statistics*)	Degrees of freedom	p
		TYPE I	TYPE II	TYPE III			
1	TA	1.631	-0.009	-0.146	9.419	180	0.000
2	SAL	-0.123	0.434	-0.835	48.797	180	0.000
3	AGE	0.263	-0.156	0.279	4.103	180	0.018
4	PHM	-0.429	0.335	-0.610	22.594	180	0.000
5	FW	0.344	0.258	-0.538	14.927	180	0.000
6	TW	0.727	-0.154	0.227	4.705	180	0.010
7	OFW	-0.136	0.066	-0.115	0.705	180	0.495
8	TLE	0.438	0.008	-0.060	0.686	180	0.505
9	MS	-1.002	0.309	-0.503	19.505	180	0.000
10	NB	0.864	-0.247	0.395	11.729	180	0.000
11	NV	4.302	-0.232	0.023	163.446	180	0.000
12	LTS.	2.170	-0.285	0.339	29.244	180	0.000
13	EA	0.260	-0.227	0.416	9.166	180	0.000
14	AP	0.108	-0.241	0.459	10.815	180	0.000
15	MP	1.112	0.016	-0.142	4.492	180	0.012
16	IT	4.399	-0.237	0.022	186.199	180	0.000
17	CPPV	-0.179	0.143	-0.262	3.441	180	0.034
18	CAPV	0.052	0.133	-0.264	3.200	180	0.043
19	STI	2.384	-0.398	0.538	56.253	180	0.000

Source: Own elaboration based on data from survey.

Outline Description of Separated Types of Agri-tourism and Rural Tourism Enterprises

Characteristics, i.e. chosen variables arithmetic averages of the three separated types of enterprises were included in the table 6.

The six enterprises belonging to the type I were distinctly different than enterprises included in two other types, especially regarding the following variables: total area, number of visitors and income form tourism activity as well as the share of the tourism income in the total income of the examined enterprises. The type I enterprises were in usual more than four times larger than the other two types enterprises. Their average total area was 83.1 hectares, whereas the average area of enterprises of type II and III was respectively 19.4 and 14.1 hectares.

Table 6. Characteristics of the surveyed agri-tourism and rural tourism enterprises by separated typological classes.

No	Variables	Measures	Mean values of variables According to the separated types (clusters)		
			TYPE I	TYPE II	TYPE III
1	TA	hectares	83.1	19.4	14.1
2	SAL	per cent	68.4	87.4	44.4
3	AGE	years	47.8	44.0	48.0
4	PHM	number of persons	3.0	4.3	2.7
5	FW	number of persons	3.7	3.4	1.3
6	TW	number of persons	3.3	2.2	2.7
7	OFW	number of persons	0.7	0.8	0.7
8	TLE	hours per year	8,533.0	5,115.7	4,573.2
9	MS	absolute number	2.0	3.1	2.4
10	NB	absolute number	16.3	8.6	13.1
11	NV	number of persons	925.0	31.2	81.4

12	LTS	days	262.5	75.5	123.0
13	EA	years	5.5	4.1	6.0
14	AP	zloty per person per day	32.0	20.8	43.1
15	MP	zloty per person per dinner	14.8	8.1	7.1
16	IT	zloty per year	191,916.7	4,829.7	15,290.4
17	CPPV	zloty per year	5,024.2	15,050.6	2,469.7
18	CAPV	zloty per year	26,299.3	30,759.7	8,706.0
19	STI	per cent	75.0	12.0	36.2

Source: Own elaboration based on the data of survey.

Type I enterprises had much more visitors per year than the other two types (i.e. 925 visitors per year on average while type II - 31 visitors per year and type III - 81 persons per year). The number of guests in the type I enterprises was 30 times higher than in the type II and more than 11 times higher than in the type III. Enterprises of type I had 16 beds on average, that was twice more than enterprises of type II and almost 20 per cent more than enterprises of type III. Because of the much higher number of visitors as well as the higher number of the beds income from tourism activity of the type I enterprises was also much higher than in the enterprises of the other two types (in type I about 192,000 Polish zloty per enterprise on average). The average share of tourism income in the total income of the type I enterprises was till 75.0 per cent and was more than 6 times higher that in type II (12.0 per cent) and more than twice as high as of type III enterprises (36.2 per cent). The examination proved that even for enterprises of type I tourism activity was the main but usually not the only source of income. It seems very interesting that 5 enterprises among 6 of the type I were specialised in horse-back riding tourism and recreation.

The type II comprised the largest number of enterprises, i.e. 117 ones, consisting till 63.9 per cent of the total number of examined enterprises. The type II enterprises earned much less on tourism activity than the other two types (4,829.7 Polish zloty per year on average) and share of tourism earnings in their total income was much lower then the others. It was a consequence of the much lower number of visitors and shorter tourist season than the other two types of enterprises (about 75.5 days per year per one examined enterprise of type II on average). Lower income from tourism activity of the type II enterprises was connected with lower prices of accommodation in particular (20.8 Polish zloty per person per day on average in comparison to 43.1 Polish zloty per person per day for type III and 32.0 Polish zloty per person per day for type I), but also with lower prices of meals in comparison to the enterprises of type I (average price of dinner was 8.1 Polish zloty per person and in type I enterprises almost 15 Polish zloty per person). Among the three separated types of enterprises the type II ones provided tourism services for the shortest time, i.e. for 4 years on average. Whereas the average share of agricultural land in the total area in the type II was higher amounting more than 87.4 per cent on average in comparison to over 68.4 per cent in type I, and only 44.4 per cent in type III. The type II enterprises gained also more income from both plant and animal commodity production The value of commodity plant production of this type was three times higher than in enterprises of type I (15,050 Polish zloty per year for type II and 5,024 Polish zloty per year for type I) and six times higher than in the type III enterprises (only 2,470 Polish zloty per year). With regard to commodity animal production, type II enterprises gained also higher income than the other two groups (over 30,000 Polish zloty per year). The variable differentiated enterprises in the type II and III in particular (the difference between the two types was more than 3.5 times more for type III). Therefore agricultural income was much less important for the type II that for types I and III. Simultaneously the type II enterprises had more sources of income than two other types (3.1 different sources of income on average in comparison to 2.0 and 2.4 sources of income in the other types).

The type III comprised 60 agri-tourism and rural tourism enterprises which had the smallest average total area (14.1 hectares) as well as the smallest share of agricultural land in the total area of the farms (only 44.4 per cent). One can acknowledge that the enterprises were a mediate group (type) between the types I and II. Their income from tourism activity was enough important for them, making about 36.2 per cent of their total income. The income value was about 15,290 Polish zloty per year on average and it was the visible distinction between the enterprises of the type III and the type II (4,830 Polish zloty per year). The average income was strictly connected with relatively large number of beds (13.1 beds per one type III enterprise on average) and quite long tourist season (123 days per year on average). The average number of visitors was 2.6 times larger than the type II enterprises, but with 1.5 times more beds and more than 1.6 times longer tourist season. Type III enterprises had much higher prices of accommodation that the other two types and on average such prices amounted 43.1 Polish zloty per person per day on average. The mean price of meals offered by the type III enterprises was lower than the other two types approximating only 7.1 Polish zloty per person per dinner. The enterprises of type III provided tourism services for about 6.0 years on average and it was the longest from the three separated types. Agricultural production was less important as a source of income for the type III enterprises with evidence of relatively low values of both animal and plant commodity production (respectively almost 2,500 Polish zloty per year and over 8,700 Polish zloty per year).

Recapitulation and Conclusions

As the result of the survey of the agri-tourism and rural tourism enterprises three classes (types) of enterprises in the Wielkopolska region were separated. The analysis of the three types allowed drawing the following conclusions:

1. The chosen set of variables allowed for differentiation of the examined SMEs population regarding their income from tourism activity as well as factors which could influence the level of income from tourism. Its usability for differentiation regarding farming activity was worse however sufficient.
2. The best enterprises proved to be the biggest farms aimed mainly at tourism activity and usually connected with horse breeding and horse recreation. They gained higher income from tourism activity, but also quite high income form farming, and especially from animal production. They seemed strong enough to function in the market even without external support, including external financial support.
3. Typical family farms assigned to the biggest typological class, including 117 enterprises, received the smallest income from tourism activity what was connected with less number of visitors per year, shorter tourist season and less number of beds that the other two classes of enterprises. The enterprises of this type were mainly agri-tourism enterprises and their experience in the tourism market was shorter than the others. That was the biggest group of SMEs within surveyed population however tourism activity was an additional and less important source of income for them.
4. Both the type II SMEs for which tourism activity was an additional but important source of income and the type III SMEs for which tourism activity was less important as a source of income seem to be focus groups for policy-makers. The type II were still dependent on farming however they were not large and they have already developed off-farm activity to support their income. The type III were the smallest of the examined population of enterprises however most of them were still agri-tourism farms. Both of groups can expand their tourism activity by better usage of their assets and diversification of activities offered to their visitors as their average number of visitors was much less than the type I enterprises even with comparable number of beds (type III). They still could extend the length of tourist season, especially SMEs of the type II.

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