Abstract: Identifying the territorial disparities in the socio-economic development of Arad County implies taking the following six research stages: selecting the relevant statistical indicators, analysing their socio-economic significance, standardising the absolute values of the indicators, calculating the Complex Index of Development, delimitating and generally characterising both the favourable areas for development and the less favourable ones. The indicators were selected to reflect the specifics of agricultural, industrial and touristic activities, of the health and education systems, of the dwellings and public utility infrastructure, of the labour and inhabiting force. The territorial distribution of the value of the 24 indicators and secondary indexes emphasised in most cases a difference between the ATU (administrative territorial units) from the Eastern and Western parts of the Arad County. The Complex Index of Development (calculated as Hull Score) offered the possibility of separating the areas that were favourable for socio-economic development (generated by the urban areas along two longitudinal lineaments, e.g. Western and Central, and in the irregular areas in the Carpathian depression) from the less favourable areas (62% of the ATU in the Arad County).

Key words: territorial disparities, socio-economic development, Arad County.

Introduction

The Arad County development strategy for the 2007 – 2013 timeframe has a system of objectives that is very well structured, one of the derived objectives being the “promoting a balanced regional development and attuning the existing disparities” (page 150). The priority identified as a method of achieving this objective is “the balanced participation of all settlements to the socio-economic development process” (page 150). Thus, identifying the territorial disparities of the socio-economic development of Arad County, which means profiling the county’s area, represents a scientific approach with practical use for local territorial reality. The study of geographical disparities will be made by closely analyzing the economic activities, labour force and infrastructure, at a micro scale level (administrative territorial units = ATU). The processes/phenomena and elements with an important role in configuring the structure and functions of the territory can be easily indentified at a local level. This level of analyze consists in “the place where everything happens” (Ianoș, Popescu, page 42, 1997).

Selecting the indicators and their significance for the development process

The actual identification of areas favourable to economic development and those less favourable from this point of view is made based on a series of indicators. It is preferable that these indicators to be systemically integrated, which means to point out the development levels and the quality/needs of the development process in at least three domains: economy, socio-demography and life standard (after Ianoș, 1997). In order to keep with the objective of this study, we have to point out the somewhat deficient database of indicators and the fact that the spatial level at which the research was made, that of ATUs, has drastically restrained the options for
achieving the indicators except for the statistical charts of each village and a database provided by the Arad County Statistical Direction (the CAEN classification of the economic agents from the ATU level for 2000 and 2006). Some of the indicators from these statistical data were used as such but most of them were grouped and processed so that secondary indicators that are representative for the analysis of the Arad County territory could be calculated.

1. The physiological density (DENSFIZ) is obtained by dividing the total population of an ATU to its agricultural area (ha). This indicator shows the land reserves with the capacity of biologically (suitable for different types of crops) sustaining the human component of the geographical space, the most important reserves are located in the plains area (Fig. 1).

![Fig. 1 The physiological density](image1)

The lowest values of the physiological density register in the villages with large agricultural areas and with a number of inhabitants placing them in the small and medium type of settlements (in Câmpia Crişurilor, partially Câmpia Mureşului, in Dealurile Lipovei) or in the case of settlements with a low number of population and small agricultural lands (the mountain area). The highest physiological densities register in the urban ATUs, especially in Arad. The type and forms of relief on which the urban areas are located as well as their demographical size is one of the factors that differentiate Arad County towns, so they can be divided in four distinct categories: 1) Arad (with a maximum value); 2) Pâncota, Curtici, Sântana, situated in the plains area or at its contact with the hills or the glacis with large agricultural areas and relatively small population, and which have low DENSFIZ values; 3) Pecica, Sebiş, Ineu, Lipova, located on different steps/forms/types of relief but with large population have medium DENSFIZ values and 4) Chişineu Criş şi Nădlac, with values close to the maximum.

2. The number of exploitation that uses tractors/1 tractor (EXPLTR). This indicator points out the necessary number of tractors for the Arad County agriculture. We can observe that the rural and urban ATUs from the plains area are better equipped from that point of view (and other agricultural machines, from what we can observe from the statistical data), this being favoured by the low degree of land fragmentation (one can even observe a tendency to merge fields on which to practice a more profitable intensive agriculture). The ATUs situated in the mountain areas register a high number of farmlands that use tractors / 1 tractor. This situation is due to the fact that on the one hand the degree of land fragmentation is higher and on the other had the number of tractors is higher (Fig. 2).

![Fig. 2 Total number of farmlands that are using tractors / 1 tractor](image2)
3. The percentage of the private residences (LOCPRIV) represents an indicator that offers an insight about the economic power of the local population and about one of the directions that financial resources meant for personal investments. Also, a high value of the percentage of the private funded finished residences from the total number of finalized residences shows that the authorities are incapable of answering the quantitative and qualitative requests of the living market. The lack of any finalized residence, neither from private or public funds, shows that the population from the mountain area and some of the villages from the plains area doesn’t have the financial power to enlarge the residential fund, having a low quality of life level (Fig. 3).

4. The percentage of economic agents from the confections industry out of the total number of economic agents (AGECCONF). This indicator was calculated in order to point out the dependency of local economies of a branch of the light industry that works in an unstable economic and financial environment and depends on the dynamic of the national continental and even world economy, comparative with the allogeneous work force, of the economic agents involved in this industry. There is a discontinuous area in the eastern-central part of the county made out of 3 urban centres (Pâncota, Ineu, Sebiș) and four villages (Târnova, Bocsig, Carand and Almaș) in which this indicator has values higher than 50%, with values of 100% in Almaș and Bocsig. The settlements Covasniț și Macea have a local economy in which the confection industry is dominant as well as other ATUs in the County (Fig 4).

5. The percentage of economic agents from car and equipments industry, calculus technique, medical equipment and instruments industry out of the total number of economic agents (AGECETH). These economic actors stimulate the county economies due to their active presence in high efficiency industrial (sub) branches, relatively stable from the production delocalization and labour force point of view. The sector of auto (sub)components seems to be ever more expanding, the economic agents from this branch and those from the calculus techniques and medical equipment and instruments are of the most importance as far as quantity and paid labour force goes, in the western part of the County (Arad, Nădlac, Irătoșu, Curtici, Chișineu Criș, Pecica) and in Lipova and Fântânele (Fig. 5).

6. The percentage of economic agents that deal with recovering wastes and recycling materials out of the total number of economic agents. (AGECDES)
Compared to 2006 the year for which we received data regarding the economic agents that where involved in collecting wastes and recyclable materials, in 2007 there more firms of the same kind in Arad County. The city if Arad concentrates most of the firms authorized to collect, revalue and recycle wastes. (14).

7. **Length of the water supplying network (APA)** 8. **Length of the sewerage network (CANAL)** 9. **Length of the gas pipe network (GAZE)** represent indicators that can evaluate the degree of endowment of the territory with urban infrastructure. The urban centers all have increased values of urban infrastructure, having all types of infrastructure necessary for specific services: drinking water supply, gases, sewerage. In the rural area the most popular type of service is the drinking water supplying network (only 15 ATUs don’t have such an infrastructure), followed by the sewerage network.

10. **Total number of education units (UNITÎNV)** shows the degree of coverage of the territory with education units. In a society in which, at least at a declarative level, an ever stronger accent is being put on perpetual learning/improving during the entire life time of one person, education is a milestone for the professional path of the future work force. The education units are unequally distributed among the ATUs of Arad County, one can observe that except the normal concentration in the main urban areas (especially in Arad where there are all types of education units) a clear demarcation of the county’s territory between the eastern side (excepting Sebeș) where there are only kindergartens and primary schools and only 1 or 2
units and the western area where the cities concentrate the most numerous and various education units with rural ATUs that have even 3 or 4 units.

**Fig. 10 Total number of education units**

11. **Total number of pupils enlisted in the primary and gymnasium education system** (ELEVPG) represents the future working population of the county and the increasing the number of pupils in this education cycles should ensure a basic level of education for most of the future workforce of the county. The territorial distribution of the education units that clearly differentiates the East area from the West imposes the same differences in the distribution of the pupils from the primary and gymnasium cycles.

**Fig. 11 Total number of pupils enlisted in the primary and gymnasium education system**

12. **The high education units** (UNIV) only function in the city of Arad (2) and represent the bases for the high education system in the entire County, ensuring in a smaller or larger extent a professional training for the workforce. **13. Student number (STUD)** has a value of over 15 000 persons concentrated entirely in Arad.

14. **Hospital beds / 1 000 inhabitants** (PATSPIT) indicates the necessary infrastructure specific to the specialized medical assistance services. This indicator is strictly correlated to the territorial distribution of hospital units and the number of population in the ATU the hospital is functioning, thus the highest values register in Birchiș and Dezna. The urban centres of the County have lesser values due to the higher number of population to which the number of beds is reported. In any case, extended areas of the County (ATUs from Zarand Mountains, Codru Moma Mountains, and parts of Câmpia Crișurilor) still remain outside the areas covered with medical services that can only be provided in hospital type units.

**Fig. 12 Hospital beds / 1 000 inhabitants**

15. **Consulting rooms** (CABMED) point out the capacity of the sanitary infrastructure of responding to the general issues of the population, especially in the rural areas, that can’t receive promptly the specialized medical services provided within a hospital. The County’s territory is relatively well covered with this type of health infrastructure, the urban centres being once more the places with the highest number of consulting rooms.
16. **Dental surgeries/1 000 inhabitants (CABSTOM)** represents an indicator that can appreciate the life standard of the population, because the services received in these units directly affects the family budget. In most of the rural ATUs from the County there is only one dental surgery unlike the urban centres where the majority of the surgeries are concentrated thus resulting higher values of this indicator. Like other health care services, a part of the County’ territory is shows a deficit in the sense that ATUs from the Zarand Mountains and Câmpia Crişurilor there aren’t any dental surgeries.

17. **Number of tourism accommodation units (UNITCAZ)**, 18. **Number of rooms in the tourism accommodation units (LOCCAZ)**, 19. **Number of hotels (HOTEL)**, 20. **Number of pensions and tourism villas (PENSVILE)** are indicators through which we can realize a general analysis of the degree of development of tourism as an alternative to agriculture. From all the types of tourism accommodation I have selected hotels because they are the main indicator for the development of high quality tourism as opposed to pensions and villas that are accommodation units for the population with medium income levels and they don’t have high costs for construction and maintenance. Choosing the pensions as a suggestive indicator was sustained by a series of geographical studies that discussed about the positive role of these types of units upon the development of rural settlements that have tourism potential.
21. Variation rate of the effective employees in the agricultural sector (SALAGR); 22. Variation rate of the effective employees in the industrial sector (SALIND); 23. Variation rate of the effective employees in the service sector (SALSERV) are indicators that with their individual and correlated evolution, show the type of economic activity that mostly shaped the employed workforce or that took the excess workforce resulted from the complex process of restructuring and reorganizing the county’s economy.

The obvious increase in the number of persons employed in the agriculture sector in some ATUs signifies an increase of performances of the agricultural activates, which is a positive element for the development of the rural areas of the County (settlements from Culoarul Mureșului, from Depresiunea Gurahonț-Hâlmaș, from Câmpiile Mureșului and Crișurilor); approximately 20% of the ATUs from Arad County registered a significant decrease in the number of employees in agriculture. In both cases the absolute values of this indicator for most of the ATUs have low values and the growth rhythm has values of 6909 % which means in absolute values that the number of employees increases with 69 persons from 1 to 70 persons. The number of employees from the industrial sector increased in most ATUs form the Arad County in most cases with 500%. Decreases of the variation rate of the employees from the industrial sector only applies to a very few ATUs (6 units) and in absolute values this signifies a loss of maximum 261 persons and minimum of 1 person. The number of employees from the tertiary sector registered a positive variation rate in most of the ATUs.

24. Unemployed population at 31.12.2006 (ŞOM)

This indicator is not relevant for emphasising the aspects regarding the territorial discrepancies of the unused workforce resources but it was the only one offered by the AJOFM Arad. Most of the ATUs from Arad registered a negative dynamic of the unemployed population during the last years which demonstrates that the capacity of the county’s economy to offer new jobs to the population has increased. The geographical distribution of the employees is dictated by the size effect of the active
population (as referenced variable) from the ATUs with the largest number of unemployed people in Arad, Sântana, Chișineu Criș, Curtic etc., and the least in the rural ATUs dominated by agricultural occupied population (Șilindia, Covasniț, Igenesti, Dezna).

1. the arithmetical average of the standardized values of the elementary indicators and indexes:
   \[ \text{INDEZV} = \frac{X_1 + X_2 + \ldots + X_{24}}{24} \]

2. the Hull Score (varies between 1 and 100 and is appreciated as the sum of the direct or reverse rapport of each elementary indicator or index with the development of the sense/amplitude: “the indicators with a direct influence have been considered in the determination process as positive and those with a reverse influence were considered negative”) (after Ianoș, 1997, page 105).

Based on these remarks the final formula for obtaining the INDEZV as a Hull score is:

\[ \text{INDEZV} = 50 + \frac{14(\text{DENSFIZ} + \text{LOCPRIV} + \text{AGECTH} + \text{AGECDEȘ} + \text{APA} + \text{CANAL} + \text{GAZE} + \text{UNITÎNV} + \text{UNIV} + \text{STUD} + \text{ELEVPG} + \text{PATSPIT} + \text{CABMED} + \text{CABSTO} + \text{UNITCAZ} + \text{LOCCAZ} + \text{HOTEL} + \text{PENSVIL} + \text{SALAGR} + \text{SALIND} + \text{SALSERV} - \text{EXPLTR} - \text{AGECCONF} - \text{ȘOM})}{24} \]

In this analysis INDEZV was calculated in both methods in order to check and compare the resulted territorial cuttings. The areas that are favourable for development and the less favourable ones obtained by applying the two methods have similar borders and no matter what method we use the diagnose for Arad County indicates a low or very low level of development for most of the ATUs except the areas in which the considered indicators show the higher degree of development with chances to acceding to a medium development level.

**Identifying the areas favourable for development (F) and the less favourable ones (D)**

The 24 indicators selected in order to point out the areas that are favourable for the territorial development and the less favourable ones are measured in different units and the compared analysis of a series of variable with this many characteristic requires standardization. The complex index of development (INDEZV) can be calculated in two methods:
In the present study we will choose for the resulted cuttings the arithmetic average method (5 areas favourable to development Arad – Curtici, Sebiș – Gurahonț, Lipova – Ineu, Nădlac – Semlac, Chișineu Criș - Sântana), based on the following arguments: 1) – values close to the threshold between the under average development level and the average development level for some rural ATUs that are in the close vicinity of urban centres or those ATUs that are “surrounded” by rural ATUs situated in areas favourable for development; thus, the results obtained by using the Hull Score in pointing out areas favourable for development are the same as the ones obtained by using the first method; 2) – the ATUs Bârzava, Vărădia de Mureș and Sâvârșin stand out as centres of dissemination for the developing process. The importance of Bârzava and Sâvârșin villages was pointed out and demonstrated by other geographical researchers (Ianoș, 1990 and 2000) emphasizing their role as local development centres of economic activities in the Mureș Corridor; 3) – the existing relations between Lipova, Pâncota and Ineu by road and railway infrastructure; 4) – similar characteristics of
the physical – geographical setting in the case of a series of ATUs that appear in the F type areas according to the cutting obtained by using the Hull Score (Lipova and Ineu appear in separate areas and Pâncota is not contained by any of them; a similar situation appears in the case of F area Sebiș – Moneasa – Dezna); 5) – functional relationships (ATUs from the F area Lipova – Ineu have as a joint activity viticulture and processing activities related to it, grapes capitalization; Sebiș has a “gateway” role for entering the mountain – lowland area Moneasa – Dezna).

Fig. 25. Delimiting the areas favourable for development (F) and the less favourable (D)

ANALYSIS OF THE IDENTIFIED AREAS

<table>
<thead>
<tr>
<th>Identified areas</th>
<th>General socio – economic characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1. Arad – Curtici (INDEZV = 0.212)</strong> = Arad, Curtici, Livada, Vladimirescu, Iratoșu, Macea</td>
<td>• dominated by the economic power of the city of Arad; • dynamic industrial and services activities in the Free Area Arad-Curtici; • the rural ATUs have varied and expanding economy (Iratoșu, Vladimirescu, Macea); • diverse and well development infrastructure especially in the urban ATUs but also in the rural ones (compared to the rural areas from other areas); • well development tourism especially in the Arad Mountains (includes that most significant qualitative and quantitative tourism infrastructure); • the labour force that was affected by the economic restructuring from the past decade presents division that demonstrates tertialization;</td>
</tr>
</tbody>
</table>
F2. Sebiş – Gurahonţ (INDEZV = 0,151)  
Sebiş, Dezna, Gurahonţ, Almaş
- extensive agricultural (insufficiently mechanized);
- industry with two industrial branches; confections (Almaş) and machines and equipments (Dezna);
- urban infrastructure relatively well developed (without gas); sanitary services well represented;
- well developed tourism (Moneasa); potential for practicing balneo-climatic tourism and agro-tourism in Dezna and Gurahonţ;
- the structure of the employed workforce is characterized by the increasing importance of the service sector and the diminishing role of the primary and secondary sectors;

F3. Lipova – Ineu (INDEZV = 0,134)  
Lipova, Ghioroc, Târnova, Pâncota, Ineu, Cermei, Bocsig
- well developed agriculture especially vine crops;
- the industrial activities are concentrated in the urban ATUs but also in some of the rural ones (confection industry in Cermei and Bocsig);
- deficient urban infrastructure in the rural ATUs (partial water supply, sewerage, missing gas supply) and better developed in the urban centres;
- poorly developed tourism but the area has strong potential of development for the agro-tourism, cultural tourism and ethno-tourism;
- the structure of the employed workforce is characterized by the increasing importance of the service sector and the diminishing role of the primary and secondary sectors;

F4. Nădlac - Semlac (INDEZV = 0,120)  
Nădlac, Semlac, Seitin
- developed agriculture highly mechanized;
- industrial activities present in the urban ATUs and Semlac;
- urban infrastructure that is evenly distributed in the territory (except for the sewerage infrastructure); deficient sanitary infrastructure and specialized medical care;
- poorly developed tourism but there is potential for practicing activities specific for the transit of persons (Nădlac);
- the structure of the employed workforce is characterized by the increasing importance of the secondary sector (Semlac) and the tertiary one (Nădlac) and the diminishing role of the primary one;

F5. Chişineu Criş – Sântana (INDEZV = 0,104)  
Chişineu Criş, Sântana, Şimand
- insufficiently mechanized agriculture;
- economic dependency of the Sântana ATUs for the confection industry and diversification of industrial activities in Chişineu Criş;
- urban and sanitary infrastructure relatively well developed but only in the urban ATUs.
- tourism activities practiced in Chişineu Criş;
- the structure of the employed workforce is characterized by the increasing importance of the secondary sector and the tertiary one and the diminishing role of the primary one.

D1. South – South – Western  
Zabranii – Şiria – Soţofronea - Peregu Mare
(ZINDEZV = 0,071)
- Zabranii, Pecica, Covasniţ, Făntânele, Felnac, Pâuliş, Peregu Mare, Şagiu, Secusigiu, Şiria, Şoţofronea, Vinga, Zabranii, Zimandu Nou
- extensive agriculture and only partially intensive; vine crops in Pâuliş şi Şiria etc.;
- industrial activities only in the urban ATUs and rural ones that are in the close vicinity of cities (Făntânele, Felnac, Vinga); confection industry in Pecica, Făntânele and Felnac, machines and equipment industry in Făntânele;
- poorly developed urban infrastructure (strictly water supply, sewerage only in Pecia, Secusigiu and Felnac);
- the structure of the employed workforce is dominated by tertiary activities (in absolute values the number of employees is reduced); international work migration is present; main activities are agricultural;

D2. Eastern – South – Eastern  
Bârsa – Şiştarevoţ – Birichiş – Hâlmăgel
- agriculture specific for the mountain and depressions areas (zoochny and plant crops) but not practiced intensively;
Conclusions

Considering the geographical differences when analyzing its socio-economic development, Arad County seems to be structured in two lineaments: (1) Arad – Curtici and (2) Chișineu Criș – Sântana and a second one from Lipova – Ineu and two areas (1) Nădlac – Semlac and (2) Sebiș – Gurahonț favourable for development, between them areas less favourable for socio-economic development interpolate. The latter type of areas includes 60% of the ATUs from Arad County. The existence and position of a series of ATUs that have the potential to surpass the underdevelopment threshold (going from this type of development to the medium development level) allowed me to identify possible directions for the extension of the areas favourable for development and thus reducing the number of the less favourable ones, in a medium time frame:

- the positive influence and divergent feature of the development process specific to the areas Nădlac – Semlac, Arad – Curtici și Chișineu Criș – Sântana will massively diminish the less favourable area South – South – Western and partially the Northern one;
- due to the positive effects from two favourable areas ( on one hand Nădlac – Semlac and Arad – Curtici, and on the other Arad – Curtici și Lipova – Ineu), the less favourable ATUs from the South – South – Western area will be favoured in the medium timeframe;
- within the most extended favourable area namely the East – South – Eastern one, a group of ATUs where the endogenous development potential (emphasized in other speciality studies as well) combined with

| (INDEZV = 0,051) | • poorly developed industrial activities;  
|                 | • deficient urban infrastructure (inexistent gas supply network; sewerage infrastructure only in Tăuț, Bârzava, Vârdia de Mureș); the education infrastructure is degraded and insufficiently equipped (lack of specialized teaching staff); sanitary infrastructure represented only by general consulting rooms (one small hospital unit in Bichirș and surgeries in Bârzava, Bata și Săvârșin);  
|                 | • tourism activities (two areas are overlapping) that are not developed to their true potential;  
|                 | • the ATUs Bârzava, Vârdia de Mureș and Bata register a pronounced positive dynamic of the number of employees from the secondary and tertiary sector; international work migration. |
| D3. (2) Northern Socodor – Zerind – Olari – Ighiști (INDEZV = 0,051) | • extensive agriculture with tendencies of merging the crop fields (especially in the plains areas);  
|                 | • confection industry in Șinteia Mare and Sepreuș;  
|                 | • poorly developed urban infrastructure (the water supply network is the most extensive one, sewerage infrastructure exists only in the ATUs surrounded by areas favourable for development; gas supply network present only in Zerind); total dependency on the specialized sanitary services (obtainable in hospitals) from the urban ATUs and the areas favourable for development;  
|                 | • poorly developed tourism activities in Pilu;  
|                 | • main activity remains agriculture but a diversification of the work force structure takes place in the ATUs close to the border (Pilu, Grânceri) or in the ATUs where the confection industry is situated (lohn); international migration due to economic reasons. |
the positive influence of the favourable areas Lipova – Ineu and (in a lesser degree) Sebiş – Gurahinţ represent factors favourable for the medium term development.

**Fig. 26. Possible direction for the areas favourable for development**

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