

TRENDS IN EDUCATIONAL TRAINING FOR AGRICULTURE IN OLT COUNTY

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Abstract

This article aims to analyse the indicators in terms of level of education, school dropout, school population, civilians employed and the average of lifespan, in order to determine the trends in the rural areas of Olt county. The porpoise of the paper is to establish benchmarks in the formulation of strategies for the improvement of the education conditions and standards in rural areas and, therefore, in agriculture and connecting them to the socio-economic reality. Olt County, by farmland it has, by the population living in rural areas, by the share of the population employed in agriculture and by the share that the value of agricultural production in the county's economy holds requires an education which should be connected to these socio-economic realities.

Key words: level of education, population growth trend equations, school dropout, school population, school units

INTRODUCTION

In the rural area of Olt County, education issues are still limited by the available reduced possibilities, poor learning, poverty and relatively high costs of education (including regarding basic education) that rural communities cannot afford. The relatively low share of qualified teachers in rural areas, compared to urban areas, is still one of the factors that negatively influence the access to quality education in rural areas.

It was considered necessary to know the problems of the structural aspect in the analysis of indicators that could lead to the establishment of some strategies for the improvement of education in rural areas, and thus in agriculture[3].

MATERIALS AND METHODS

As statistical indicators were calculated: average of periods of time, comparison indicators with fixed base and linked basic.

Standard deviation (σ), used in calculating the coefficient of variation (c%), is calculated as an mean square value of deviations of all series elements of their arithmetic mean [10]:

$$\sigma = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n}}$$

The standard deviation is used for the estimation of errors of selection in calculating correlation.

The coefficient of variation (c%) is calculated as a ratio between the deviation of mean square value and arithmetic mean. It expresses as percentages: $c\% = (\sigma/\bar{x}) * 100$

Significance. The closer to zero the value of c% is, the weaker the variation is, the collectivity of analysed data is more homogeneous, the mean having a high degree of representativeness. The higher the value of c% is, the more intense the variation is, the collectivity is more heterogeneous, and the mean has a low significance level.

It is estimated that at a rate of more than 35-40%, the average is no longer representative and the data should be separated into a series of components, per groups, depending on changes in other characteristics of the group. In finding the tendency for some data, the indicators were used: the average rate of annual growth and the adjustment equations. Year growth rate is calculated using the

$$r_{2000-2014} = 13 \sqrt{\prod(p_1/p_0) - 1};$$

where: $\prod p_1/p_0$ = the product of chain indicators for the analysed period.

Using adjustment equation of data series, time series are obtained, that highlight the development trends and that replace empirical series. The equations are used in terms of time: linear, $Y = a + bt$; of second-degree, $Y = a + bt + ct^2$; third-degree, $Y = a + bt + ct^2 + dt^3$ etc. In order to find the regression function of parameters, it is applied the Method of least squares: $\sum(y_i - Y_{ti})^2 = \min[1]$.

Data from this study were drawn from Statistical Yearbook, published by National Institute of Statistics, for the period 1990-2014[5].

RESULTS AND DISCUSSIONS

Olt county, by its agricultural land, by the population living in rural areas, by the share of the population employed in agriculture and by the share that the value of agricultural production has in economy of the county, requires an education that should be anchored in these economic realities .

Agricultural land holds a very large share of the land fund of the county, 80% (440,016 ha) in 2000 and 79.39% (436 515 ha) in 2014. (Table 1).

Table 1. The size and structure of how to use the land, in Olt county, during 2000-2014

Crt. No	Way of use	2000		2007		2014	
		ha	%	Ha	%	ha	%
1	Total	549,828	100.00	549,828	100.00	549,828	100,00
2	Agricultural	440,016	80.03	434,846	79.09	436,515	79.39
3	Arable	385,190	70.06	388,483	70.66	390,336	70.99
4	Pastures	34,819	6.33	31,784	5.78	33,038	6.01
5	Meadow	776	0.14	529	0.10	556	0.10
6	Vineyards and vine nurseries	9,643	1.75	7,634	1.39	7,465	1.36
7	Orchards and tree nurseries	9,588	1.74	6,416	1.17	5,120	0.93
8	Non-agricultural land	109,812	19.97	114,982	20.91	113,313	20.61

The analysed period, regarding the evolution of the population, is characterized by high variation coefficients of 23.43% (*high*) for data series of total population, of 34.59% (*high*) for the urban population and 10.06% (*middle*) for the rural population (Table 2).

The total population of the county has decreased over the period 2000-2015, from 511,100 inhabitants in 2000 to 485.0 thousand inhabitants on 1st of January 2015 (Mean annual rate of -0.78%) (Table 2).

Table 2. The evolution of the total population, in Olt County, during 2000-2015

Residence areas	2000	2005	2010	2015	Average	Standard deviation	Variation coefficient (%)	Annual rate	
	thousands	thousands	thousands	thousands					
Total	511,1	495,2	476,6	454,7	485,0	133	27.43	High	-0.78
Urban	209,6	211,3	205,4	197,4	205,9	71	34.59	High	-0.40
Rural	301,5	283,9	271,2	257,3	279,1	28	10.06	middle	-1.05

Interestingly is that the rural population fell from 301.5 thousand inhabitants to 197.4 thousand inhabitants, with a rate of -1.05% per year.

By adjusting the data using trend equations we find that the data on the urban population are representatively adjusted (correlation coefficient $r = 0.94$) by a second-degree equation, and rural population evolution by a

linear equation ($r = 0.99$). Both equations show a sharp downward trend during the studied period (Fig. 1 and Fig. 2), and that will continue for the next period.

The total school population in the county of Olt is in a sharp decline, respectively, from 91,460 people in the school year 2000/2001 to 71,669 people in school year 2012/2013.

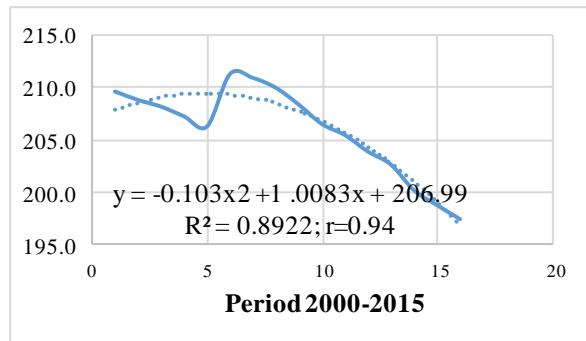


Fig.1. Evolution of total urban population in county Olt, for the period 2000-2015

The rate of decline for this period is -8.45%, much higher than the decrease of total

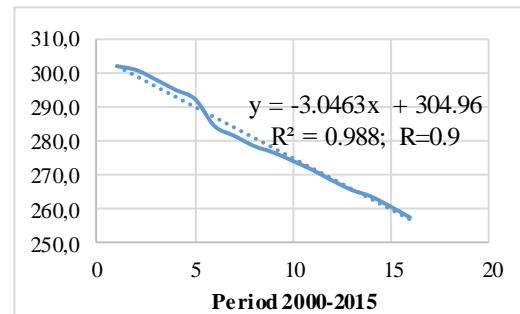


Fig.2. Evolution of total rural population of county Olt, for the period 2000-2015

population of -0.78%, because most of the decline in population is for the age up to 30 year old. (Table 3).

Table 3. The evolution of the school population by level of education, in Olt County, during 2000-2013

Education levels	2000/01	2005/06	2007/08	2009/10	2012/13	Mean	Standard deviation	Variation coefficient		Anual rate
	nr	nr	nr	Nr	nr	nr	nr	%	semf	%
Total	91,460	82,809	78,303	74,625	71,669	77,934	5,259	6.75	low	-8.45
Preschool	15,161	15,425	14,288	14,052	11,864	14,135	496	3.51	low	-7.26
Elementary (Cl. I-IV)	24,386	21,347	19,247	17,666	18,026	19,216	2,238	11.65	mid	-8.80
Middle school (Cl.V-VIII)	29,283	22,248	21,637	19,969	17,559	21,179	2,967	14.01	mid	-10.22
High-school	15,604	16,229	15,896	17,672	20,068	17,458	1,358	7.78	low	-7.03
Vocational and apprenticeship	4,570	5,766	5,201	2,648	213	3,296	1,539	46.70	high	-5.02
Post-secondary and foreman	2,175	1,272	1,379	2,061	3,427	2,082	619	29.75	high	-12.7
Higher education	-	522	655	557	512	605	65	10.72	mid	-6.01

By level of education, in Olt County, we find that the school population is in a continuous decline in all categories of education: by -7.26% to preschool, by -8.80% from the elementary, by -10.22% in middle school, by -7.03% in high school, by -5.02% in vocational and apprenticeship, by -12.7% in high school and foremen and by -6.01% in higher education.

The school population structure also shows oscillations from one year to another. Preschool education is between 16.6% in the school year 2000/2001, and 18.8% in the school year 2009/2010, 32.0% in elementary education from 2000/2001, and 24.5% in the school year 2012/2013. It is noted increase in the share of secondary education from 17.1% in the school year 2000/2001, to 28.00% in school year 2012/2013. (Fig.3)

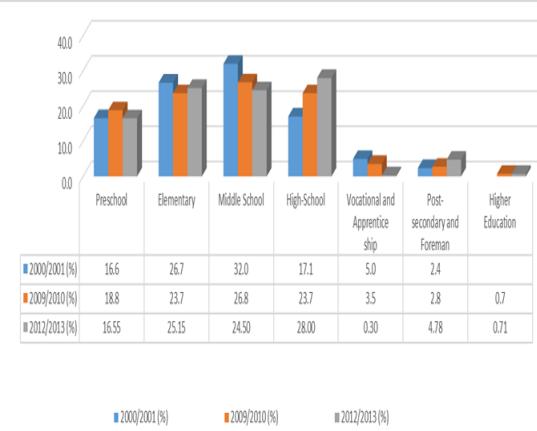


Fig. 3. Structure of School Population per Education Levels, in Olt County

Analysing the school dropout in the Development Region of South-West Oltenia, there are revealed significant differences in the component counties. The lowest dropout rates in elementary education (0.2%), middle education (0.3%) are in Gorj County in 2012.

The highest dropout rates in school year 2012 are recorded in Mehedinți County of 1.5% for elementary and 2.8% for middle school education. (Table 4).

Table 4. The level of dropout rate in elementary and middle school education, in Olt County

Crt . No.	Educatio n levels	Elementary education			Middle school education		
		201 0	201 1	201 2	201 0	201 1	201 2
		%	%	%	%	%	%
1	Reg. SW Oltenia	1.3	1.3	0.8	1.6	1.7	1.5
2	Dolj	1.5	1.6	1.1	2	2.4	2.7
3	Gorj	0.7	0.9	0.2	0.6	0.8	0.3
4	Mehedinți	1.6	1.8	1.5	1.9	2.5	2.8
5	Olt	1.30	1.40	1.00	1.60	1.50	1.00
6	Valcea	1.2	0.7	:	2	1.2	0.3

Dropouts in high-school, vocational and post-secondary education, (Table 5), according to available data, shows very high values. Thus, it appears that in 2010, the dropout rate was 3.3% for high-school education, in Valcea County and of 25.1% for vocational education in Mehedinți County.

The school dropout in post-secondary education shows very high rates in all

counties, ranging between 8.6% in Olt County and 15.9% in Valcea County (Table 5).

Accentuated decrease of school population has led to a decline of schools and their equipping with specific workshops for levels of training.

Table 5. The level of dropout rate in high school, vocational and post-secondary education in Olt County

Crt. No.	Education level	High-School	Vocational	Post- secondary		
		2010	2010	2010	2011	2012
		%	%	%	%	%
1	Reg. SW Oltenia	3.2	17.3	5.5	5	9.7
2	Dolj	2.9	13.8	8.7	5.5	9.2
3	Gorj	2.8	24.4	3.6	4.2	9.3
4	Mehedinți	8.2	25.1	:	2	11
5	Olt	0.7	10.2	4.6	6.8	8.6
6	Valcea	3.3	15.9	9.7	5.6	15.9

In Olt County, the total number of units decreased to 21.3%, from 785 in 1996 to 167 in 2014 (Table 6). Important decreases that occurred during this period: from 3.8% in pre-school, to 37% in pre-university education, to 32% in high-school education and 55.7% in middle school education (Table 6).

Table 6. The evolution of schools by level of education, in Olt County, during 1996-2014

Crt. No	Education levels	UM	1996	2000	2005	2010	2012	2014
1	Total	no	785	549	480	187	176	167
		%	100.0	69.9	61.1	23.8	22.4	21.3
2	Pre-school education	no	371	270	261	31	24	14
		%	100.0	72.8	70.4	8.4	6.5	3.8
3	Pre-university education	no	414	279	219	156	152	153
		%	100.0	67.4	52.9	37.7	36.7	37.0
4	Elementary education	no	152	53	:	:	:	:
		%	100.0	212	196	189	121	118
5	Middle-school education	no	100.0	92.5	89.2	57.1	55.2	55.7
		%	26	26	26	33	33	32
6	High-school education	no	100.0					
		%	12	1	1	:	:	:
7	Vocational education	no	11	2	2	1	1	2
8	Post-secondary education	no						

Number of school workshops also presents significant decreases correlated with decreased number of schools with fewer

pupils. The total number of school workshops in the county decreased from 60.2% in 2014, compared to 1990 (from 128 to 77). (Table 7)

Table 7. Evolution of number of school workshops by educational level in Olt County, for the period 1990-2014

Crt. no	Education levels	UM	1990	2000	2005	2010	2012	2013	2014
1	Total	no	128	151	112	98	93	85	77
		%	100.0	118.0	87.5	76.6	72.7	66.4	60.2
2	Elementary and middle- school education	no	47	46	25	17	7	7	6
		%	100.0	97.9	53.2	36.2	14.9	14.9	12.8
3	High-school education	no	68	74	79	81	86	78	71
		%	100.0	108.8	116.2	119.1	126.5	114.7	104.4
4	Vocational education	no	13	30	8	:	:	:	:
		%	100.0	230.8	61.5				
5	Post-secondary education	no	:	1	:	:	:	:	:

A slight increase in the number of workshops is found in upper secondary school from 68 in 1990 to 71 in 2014 (104.4% increase). (Table 7)

The pre-university educational infrastructure at regional level (South-West Oltenia Region) (741 schools, 151 high-schools in 2005) is in a quite advanced state of degradation and with a highly insufficient equipment [8, 9].

Analysing the number of graduates in Olt County, during 1990-2013, we find a reduction from 12,945 people in 1990 to

9,039 people in 2013 (69.8%). In elementary and secondary education this decrease is of 54.4%, from 7,748 persons in 1990 to 4,256 persons in 2013. Important decreases in the number of graduates are in agricultural high school from 880 graduates in 1990 to 193 graduates in 2011, vocational education from 2,075 in 1990 to 56 in 2013. Increases in the number of graduates is found at high school graduates and theoretical high-school from 212 graduates in 1990 to 1,744 graduates in 2013. (Table 8)

Table 8. The evolution of the number of graduates by level of education, in Olt County, for the period 1990-2013

Crt. No	Education levels	1990	2000	2005	2010	2011	2012	2013
1	Total	12,945	12,577	12,121	10,679	8,698	9,565	9,039
		100.0	97.2	93.6	82.5	67.2	73.9	69.8
2	Elementary and middle school education	7,748	7,016	5,373	5,475	4,256	4,180	4,256
		100.0	90.6	69.3	70.7	54.9	53.9	54.9
3	High-school and theoretical high-schools	212	1,786	1,897	1,746	1,627	1,549	1,744
		100.0	842.5	894.8	823.6	767.5	730.7	822.6
4	Agricultural high-school	880	371	115	77	193	:	:
		100.0	42.2	13.1	8.8	21.9	:	:
5	Forest high-school	:	26	:	:	:	:	:
6	Agro-mountain high-schools	:	:	44	:	:	:	:
7	Veterinary High-Schools	:	122	100	42	42	:	:
8	Secondary Vocational Education	2,075	1,483	2,612	908	59	80	56
9	Post-Secondary education	:	913	464	722	878	1,052	1,182
10	Foremen schools	:	137	77	134	170	139	148
11	Higher education - bachelor	:	:	87	147	168	161	109

Table 9. The structure of graduates by level of education, in Olt County, for the period 1990-2013

Crt. no.	Education levels	1990	2000	2005	2010	2011	2013
		%	%	%	%	%	%
1	Total	100.0	100.0	100.0	100.0	100.0	100.0
2	Elementary and middle school education	59.85	55.78	44.33	51.27	48.93	47.08
3	High-school and theoretical high-schools	1.64	14.20	15.65	16.35	18.71	19.29
4	Agricultural high-schools	6.80	2.95	0.95	0.72	2.22	:
5	Forest high-school	:	0.21	:	:	:	:
6	Agro-mountain high-schools	:	:	0.36	:	:	:
7	Veterinary High-Schools	:	0.97	0.83	0.39	0.48	:
8	Secondary Vocational Education	16.03	11.79	21.55	8.50	0.68	0.62
9	Post-Secondary education	:	7.26	3.83	6.76	10.09	13.08
10	Foremen schools	:	1.09	0.64	1.25	1.95	1.64
11	Higher education - bachelor	:	:	0.72	1.38	1.93	1.21

A more detailed analysis of high-school education in the agriculture and veterinary medicine highlights the following:

- A variation in the number of agricultural high schools, but by comparing the percentage of the total of the county is a level between 2.94 and 11.53%.

The report of a yearly discrepancies between the number of students enrolled and the number of graduates, in which the number of enrolled students is increasing but the number of graduates is decreasing, a trend that is noticed for teachers, too;

- Veterinary high schools (the only one of its kind in the county) are represented by a number of annually increasing students enrolled (although, by comparison towards the total in the county is between 1.80 and 5.44 %), but decreasing on graduates (compared to the total of county level, is much lower, between 0.43 and 5.11%).

Even in this situation the teachers had an increasing trend, which in the past year was a number of 60[4]. (Table 10)

Table 10. The structure of high schools and graduates of the agriculture and veterinary profile in Olt County

Name of the indicator	M.U.	2006	2007	2008	2009	2010	2011
High-school with agricultural profile							
Number of high-schools	Number	3	3	1	1	2	2
	% towards total of high-school	11.53	11.53	3.84	2.94	6.06	6.06
Enrolled students	Number	385	287	363	520	898	1130
	% towards total of students	2.41	1.80	2.26	2.94	4.74	5.44
Graduates	Number	208	-	16	54	77	-
	% towards total of graduates	5.11	-	0.43	1.19	1.82	-
Teaching staff	Number	63	44	10	11	12	19
	% towards total of p. d.	5.42	4.04	0.86	1.04	0.57	1.46
High-schools of veterinary profile*							
Number of high-schools	Number	-	-	1	1	1	1
	% towards total of high-schools	-	-	3.84	2.94	3.03	3.03
Enrolled students	Number	-	-	166	188	168	175
	% towards total of students	-	-	1.03	1.06	0.88	0.84
Graduates	Number	-	-	-	55	42	-
	% towards total of graduates	-	-	-	1.22	0.99	-
Teaching staff	Number	-	-	40	26	64	60
	% towards total of T.s.	-	-	3.47	2.46	5.63	4.61

* Years 2006 and 2007 are not given. Processed according to: Statistical Yearbook of Olt County, NIS, Olt Branch, Issue 2012

From what was mentioned before, it results that the structure and forms of influence of high-schools in the agriculture profile for the population have an important role in attenuation of rural problems in the training and employment of labour in agriculture.

As an effect and as a result of the training, we will analyse the civilian population employed

per activities and life expectancy as living standards.

Analysing the civil population employed on economic activity in the county of Olt, there are some oscillations of variation coefficient between low and middle limits, and which falling within normal statistical limits.

Table 11.The evolution of civil population on activities, in Olt County, during 2008-2014

Crt. No	Economic activities	2008	2011	2014	Average	Standard deviation	Variation coefficient	Annual rate
		Thousands of persona	Thousands of persona	Thousands of persona	no	no	%	semf %
1	Total	169.3	162.6	160.8	163.74	3.1	1.89	low -0.73
2	Agriculture, silviculture and fishing	76	78.2	74.6	77.24	1.6	2.06	low -0.27
3	Extractive industry	1.30	0.9	0.9	0.99	0.1	13.98	middle -5.12
4	Manufacturing industry	32.5	27.2	27.6	27.74	2.2	7.89	low -2.31
5	Constructions	10.5	7.9	8.7	8.41	0.9	11.05	middle -2.65
6	Wholesale and Retail	12.5	14.1	14.9	14.00	0.8	5.49	low 2.54
7	Public administration and defense; public social insurance	4.8	3.8	3.7	4.09	0.4	10.24	middle -3.65
8	Education	7.6	6.9	6.9	7.11	0.3	3.70	low -1.37
9	Health and social assistance	7.2	6.4	6.2	6.80	0.5	7.30	low -2.11

It is noteworthy that for the entire period, the trend is of numeric declining of the employed population projecting an annual negative growth rate of -0.73% at county level, the work force is steadily decreasing, from 169.3 thousand persons employed in 2008 to 163,740 people in 2014. In the agricultural branch, there are very small variations in this

period (coefficient of variation of 2.06%) and the average work force of 77,240 people is maintained.

Economic and political crisis still have negative effects. Job reductions are found in mining and quarrying, manufacturing and construction industry. These reductions lead to increase of the number of unemployed but

also to the population employed in agriculture, because most workers live and work in these small areas of crops. For this

category of staff, retraining programs are needed because most of them are young.

Table 12. The size and structure of the employed civilian population per activities, in the Olt County, for the period 2008-2014

Crt. no	Economic activities	2008		2011		2014	
		Thousands of persons	%	Thousands of persons	%	Thousands of persons	%
1	Total	169.3	100.00	162.6	100.00	160.8	100.00
2	Agriculture, forestry and fishing	76	44.89	78.2	48.09	74.6	46.39
3	Extractive industry	1.3	0.77	0.9	0.55	0.9	0.56
4	Manufacturing industry	32.5	19.20	27.2	16.73	27.6	17.16
5	Constructions	10.5	6.20	7.9	4.86	8.7	5.41
6	Wholesale and Retail	12.5	7.38	14.1	8.67	14.9	9.27
7	Public administration and defence; public social insurance	4.8	2.84	3.8	2.34	3.7	2.30
8	Education	7.6	4.49	6.9	4.24	6.9	4.29
9	Health and social assistance	7.2	4.25	6.4	3.94	6.2	3.86

Analysing the structure of employment, it is found that the main activity is agriculture which holds 46.39% of the employed population in 2014, being double than 23.13% as they together hold in mining, manufacturing and construction industry.

The average unemployment rate in 2011 was 6.86%, in 2012 was 6.91% and in 2013 was 7.0%[6].

It is very important that education and training system to adapt to the labour market requirements in terms of training new skills. The educational and training programs have to be adapted to the needs of both the employees and population looking for a job[7].

It is required a restructuring of the entire economic activity of the county. First it is necessary to diversify farming activities, an increase in activities with higher consumption of manpower, particularly the livestock industry. It is also necessary to develop food

processing industry of primary agricultural, plant and animal production[8].

The quality of education and educational reform are affected by insufficient infrastructure and weak endowment of the existing, staff motivation (low wages) and the poor material condition of the population[8].

Among synthetic indicators that reflect human activity as a whole, we consider that the one expressing average life is significant to reflect the standard of living, of satisfaction of existence.

Despite the fact that the South-West Oltenia region is considered poor, life length is 75.18 years per region, close to the level in the country which is of 75.47 years. In Olt County is 74.33 years, being 5 years older than the average lifespan of the year 1990, which was 69.28 years. (Table 13)

Table 13. The evolution of life expectancy at country level and South-West Oltenia, for the period 1990-2014

Crt. No	Country, region, county	1990	2000	20005	2010	2012	2014
1	TOTAL of country	69.56	70.53	71.76	73.47	74.26	75.47
		100.0	101.4	103.2	105.6	106.8	108.5
2	Reg. SOUTH-WEST OLTEANIA	69.33	70.61	71.62	73.24	74.32	75.18
		100.0	101.8	103.3	105.6	107.2	108.4
3	Dolj	69.08	70.2	71.22	72.83	73.8	74.82
		100.0	101.6	103.1	105.4	106.8	108.3
4	Gorj	69.39	70.94	71.96	73.54	74.3	75.02
		100.0	102.2	103.7	106.0	107.1	108.1
5	Mehedinti	68.46	70.5	71.21	72.23	73.27	74.2
		100.0	103.0	104.0	105.5	107.0	108.4
6	Olt	69.28	69.92	71.23	72.55	73.93	74.33
		100.0	100.9	102.8	104.7	106.7	107.3
7	Valea	70.45	71.91	72.85	75.5	76.75	77.93
		100.0	102.1	103.4	107.2	108.9	110.6

CONCLUSIONS

The rural local area of the Olt County is facing numerous shortcomings that contribute to increasing disparities between urban and rural areas through its components: rural economy, demographic potential, health, school, culture etc.

A thorough analysis of high-school education revealed that there is a variation in the number of agricultural high-schools and that annual discrepancies remain between the growing number of students enrolled and the number of graduates declining. A solution can be in adapting programmes so that they turn into one attractive educational environment and the support of a baccalaureate differentiated so as to accommodate the before and after concerns of future graduates.

By the training levels in Olt County it is found that school population is in continuous decline in all categories of education. Also dropout of high-school, vocational and post-secondary education shows very high values, both at regional and county level.

Correlated with the reduction of students and of schools, it is observed a significant decrease in the number of high school workshops. It may be noted that the abolition of a workshop on medium and long term, is more expensive than its keeping in the regime preservation. Reducing the minimum number of students who can participate in the group practice in the workshop would be a short-term solution for keeping these workshops in school circuit.

School dropout in primary school population are caused by poor conditions of living standards in rural areas. The renunciation of pupils to continue their studies after middle school are due to lack of perspective after gymnasial education.

To develop the educational system in Olt County, to increase employment of the active population, and to reduce disparities between urban and rural areas are necessary measures to implement integrated strategies for development of the education system, diversification of economic activities where to focus on agricultural activities (livestock development, development of food industry).

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