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IMPACT OF RURAL DEVELOPMENT PROGRAM ON ACHIEVIENG VIABILITY OF RURAL AREAS IN BULGARIA

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Abstract

Development of agricultural sector requires a complex approach toward reaching viability of rural arias. By application of correct government support measures, it is possible to achieve sustainability in agricultural sector. The main aim of the study is to assess the impact of changes of Rural Development Program (RDP) on achieving viability of rural arias in Bulgaria. The tasks of the paper are as follows: 1) Literature review of the role of the policy in RDP; 2) Changes in RDP 2007-2020 in Bulgaria; 3) Impact of the changes of RDP on reaching viability of rural areas by ARDL models. The conducted analyses resulted in conclusions and relevant policy recommendations. Results are part of the scientific project DN 15/8 11.12. 2017 Sustainable multifunctional rural areas: reconsidering agricultural models and systems with increased demands and limited resources, funded by the Bulgarian research fund.

Key words**:** *RDP, ARDL Bulgaria, agriculture, policy change, policy recommendation*

INTRODUCTION

In many European countries the main focus of agricultural policy is directed to support prices and incomes of the farmers. In the last several years there is a tendency of adopting a wide range of policy measures ad-dressed to economic sustainability in rural areas. The purpose of this policy is to ensure that farmers will continue to contribute to the supply of re-sources from rural areas. Some authors [5] consider that agriculture is the main driving force of rural economies and in this respect it is necessary to promote the sustainable development of rural areas and improve the living conditions of local communities. In addition to the previous authors [1] states that Rural Development Programme (RDP) provides a major opportunity to overcome the existing problems in the agricultural sector and not to face significant differences between the development of rural and urban municipalities. The RDP and the Leader approach, as tools for decentralized management and integrated development of rural areas, create the conditions for cooperation and partnership, between different municipalities and areas [16]. Applied agricultural policies support production diversification in agriculture to achieve poverty reduction. According to [4], as a result of applied agricultural policies, investment support and development programmes, there is a positive impact on farm incomes and the environment as well as on enhancing environmental awareness among farmers. Agricultural policies and the RDPs have a positive impact on the diversification of agricultural activities in rural areas and rural landscapes. According to some authors [11] although rural development policy is directed to rural development, most of the policy measures are related to agricultural development by promoting restructuring and diversification and few of the measurements promote non-agricultural activities. An OECD research [14] presents agricultural policy as important for those who receive in-come from agriculture, but the role of these policies for rural economies is declining. The study argues that the emphasis in agricultural policy in many OECD countries is shifting from agricultural production to land use and the environment. In a different research, it is considered that rural development policies have a poor

emphasis on promoting sustainable resource use or biodiversity conservation [3].

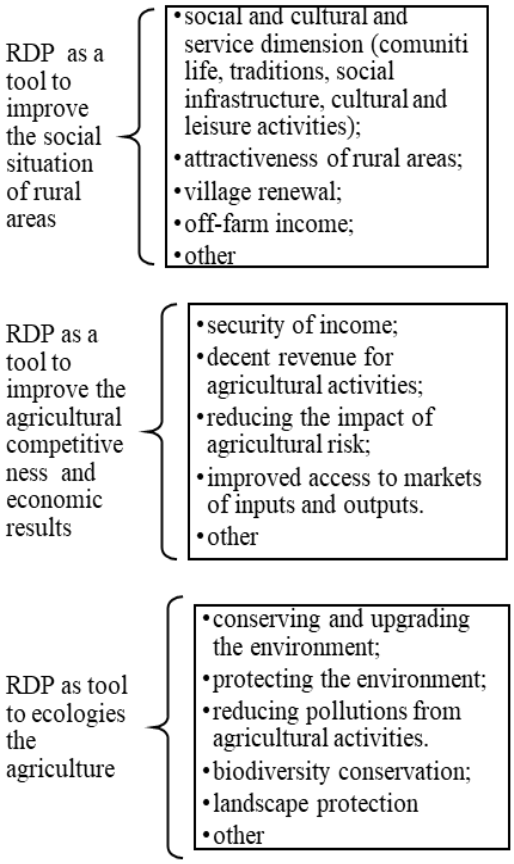

Fig. 1. Main findings of literature review
Source: own findings.

Some of the theories connect the RDPs with possible transformation of the small farms to sustainable market-orientated structures. Authors [12] consider that the RDP measures are related to overcoming the existing constrains of small farms, their restructuring and turning them into modern and competitive agricultural production units. As a consequence, they have a socio-economic role and an important role for the development of agriculture and rural areas in Bulgaria. The EU supports the sustainable and integrated development of rural areas and plays a significant role in the management of agricultural land, environmental protection, biodiversity and landscape. According to a research, even by increasing the profitability of agriculture, the agricultural policy leads to disruption of the land use model [10]. The conclusions of the literature review are shown in Figure 1.

MATERIALS AND METHODS

The main aim of the study is: to assess the impact of changes of the RDP on achieving viability of rural arias in Bulgaria.

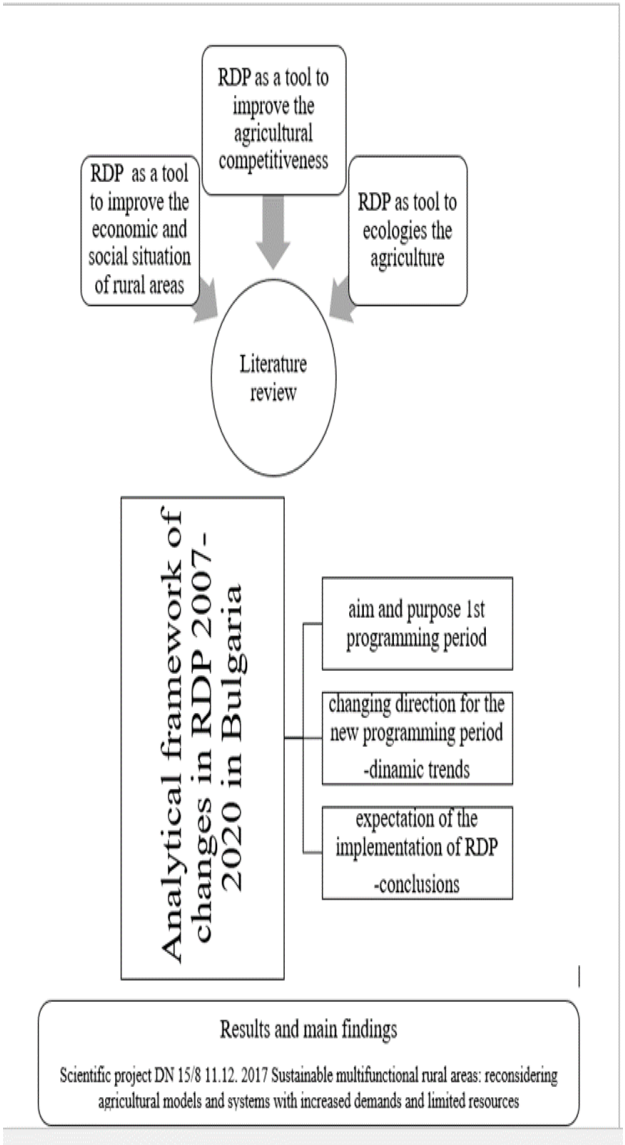

Fig. 2. Methodological framework
Source: own findings.

The proposed research has set up the following tasks:
(1)Literature review of the role of the RDP policy. The aim of this part is to find the main factors influenced by RDP.
(2)Changes in RDP 2007-2020 in Bulgaria. Two full periods of RDP were obtained in Bulgaria until own, which reflect the agriculture and rural areas. The study shows the difference allocations between the studied periods.

(3)Impact of the changes of RDP on reaching viability of rural areas by ARDL models. The model includes estimation of the variables which have significant impact on GVA. The developed ARDL model estimates the effect of the change between the periods.

On the basis of the analysis conclusions and relevant policy recommendations are made. The logic of the study is shown in Figure 2.

The model in the study is based on Harizanova-Metodeva and Metodiev discoveries and is adaped by the collected data for this paper [8], [9].

Results are part of the scientific project DN 15/8 Sustainable multi-functional rural areas: reconsidering agricultural models and systems with increased demands and limited resources, funded by the Bulgarian research fund.

RESULTS AND DISCUSSIONS

Impact of the changes of RDP on reaching viability of rural areas

National economy of Bulgaria for the last 10 years noted a positive trend and has around 15% total growth. The dynamic is shown in Figure 3. For the last 5 years the share of agricultural GDP according to other sectors is stable around 4.8%.

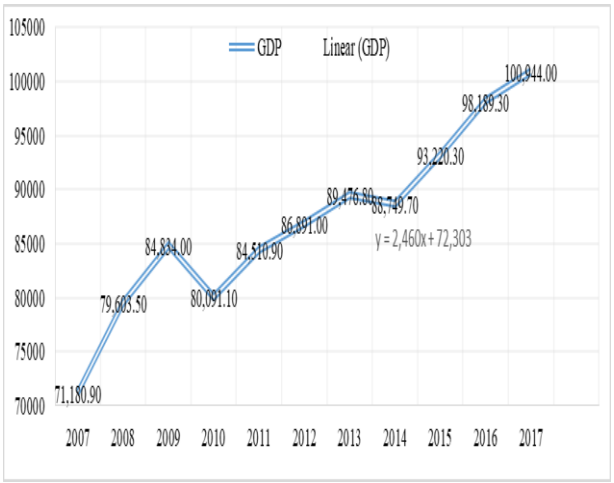

Fig. 3. State and development of the national economy, macroeconomic framework
Source: [13].

Figure 4 presents the dynamics of GDP of agriculture. The numbers show a positive trend, but with very low change. In the first programming period the change is visibly higher than in the second period, when the levels can be described as stable with very low fluctuation.

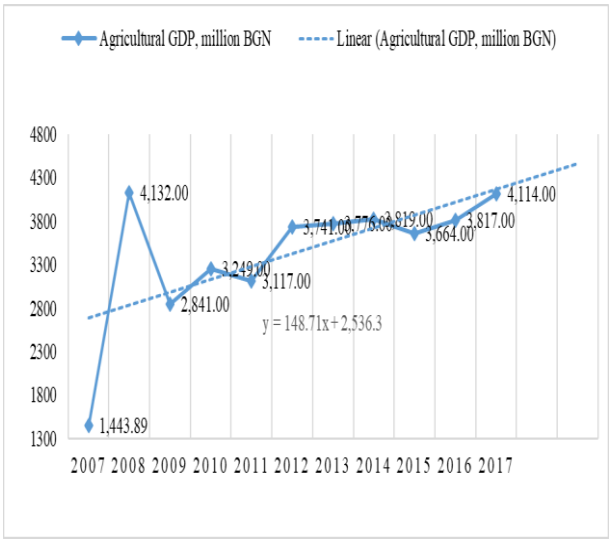

Fig. 4. Development of Agricultural sector by GDP change
Source: NSI (2007-2018) [13].

The income per household in Bulgaria is increasing since Bulgaria's joined the EU. The data is presented in Figure 5.

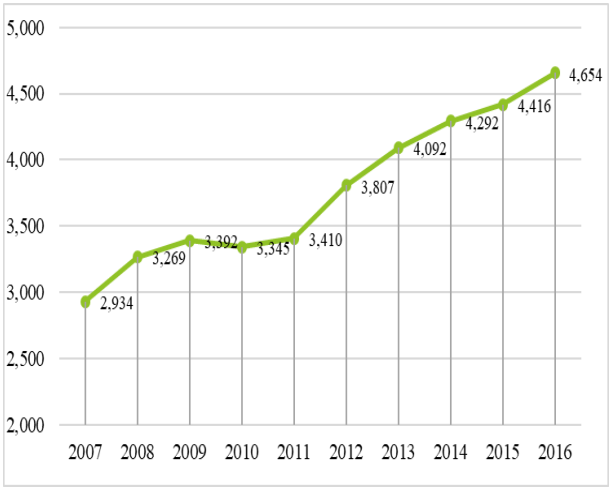

Fig. 5. Average annual income per household member in 2007-2016, BGN
Source: [13].

Analysis of RDP for 2007-2017

There is a difference in measures between both programming periods. The measures in the present programming period are simplified. The number of measures for 2014-2020 is reduced to achieve more flexibility. (Table 1).

Table 1. Changes in RDP measures for 2007-2020

MEASURES in 2007-2013	MEASURES in 2014-2020
111 Training, information and diffusion of knowledge 112 Setting-up of young farmers 114 Use by farmers and forest holders of advisory services 121 Modernisation of agricultural holdings 122 Improving the economic value of the forests 123 Adding value to agricultural and forestry products 141 Semi-subsistence farming 142 Setting-up of producer groups 143 Provision of farm advisory and extension services in Bulgaria and Romania 211 Natural handicap payments to farmers in mountain areas 212 Payments to farmers in areas with handicaps, other than mountain areas 213 Natura 2000 payments and payments related to Directive 2000/60 / EC (WFD) 214 Agri-environmental payments 223 First afforestation of non-agricultural land 226 Restoring forestry potential and introducing prevention actions 311 Diversification into non-agricultural activities 312 Support for the creation and development of micro-enterprises 313 Encouragement of tourism activities 321 Basic services for the economy and rural population 322 Village renewal and development 41 Implementation of the local development strategies: 411 Improving the competitiveness of the agricultural and forestry sector 412 Improving the environment and the countryside 413 Quality of life in rural areas and diversification of the rural economy 421 Inter-territorial and transnational cooperation 431 Running costs, acquisition of skills and animation Technical assistance	Measure 1 Transfer of knowledge and awareness actions Measure 2 Consultancy, farm management services and farm replacement Measure 4 Investments in physical assets Measure 6 Farm development and business Measure 7 Basic services and village renewal in rural areas Measure 8 Investments in the development of forest areas and improvement of the viability of forests Measure 9 Creating producer groups and organizations Measure 10 Agroecology and climate Measure 11 Organic Farming Measure 12 Payments on "Natura 2000" and the Water Framework Directive Measure 13 Payments to areas facing natural or other specific constraints Measure 14 Animal Welfare Measure 15 Environmental services and climate in forestry and forest protection Measure 16 Collaboration Measure 17 Risk Management Measure 19 Leader Measure 20 Technical Assistance

Source: [6].

In the period of 2014-2020, the European Commission proposes a new programming framework with decreasing the axes from the previous programming period and greater flexibility in the transfer of financial resources between measures and priorities.

Table 2 presents that the accumulation of the budget for all the measures is more than 90 % excluding measures "Use by farmers and forest holders of advisory services", "Setting-up of producer groups" and "First afforestation of non-agricultural land".

Table 2. Assimilation of the RDP for 2007-2013 by measures

	Measure	Budget EAFRD, euro	% Assimilation
M111	Training, information and diffusion of knowledge	7,424,000	98.72
M112	Setting-up of young farmers	95,100,000	97.08
M114	Use by farmers and forest holders of advisory services	81,000	36.88
M121	Modernisation of agricultural holdings	433,366, 038	99.35
M122	Improving the economic value of the forests	445,000	95.52
M123	Adding value to agricultural and forestry products	167,082, 500	101.04
M141	Semi-subsistence farming	36,116,000	99.28
M142	Setting-up of producer groups	196,000	48.64
M143	Provision of farm advisory and extension services in Bulgaria and Romania	4,819,468	100.24
M211	Natural handicap payments to farmers in mountain areas	134,900	99.88
M212	Payments to farmers in areas with handicaps, other than mountain areas	42,130,000	99.91
M213	Natura 2000 payments and payments related to Directive 2000/60/EC	40,780,000	99.88
M214	Agro-environmental payments	379,300	100.04
M223	First afforestation of non-agricultural land	6,450,000	77.48
M226	Restoring forestry potential and introducing prevention actions	12,370,000	101.58
M311	Diversification into non-agricultural activities	60,147,500	97.22
M312	Support for the creation and development of micro-enterprises	88,630,000	97.09
M313	Encouragement of tourism activities	19,150,000	97.05
M321	Basic services for the economy and rural population	610,953	97.84
M322	Village renewal and development	164,000	98.63
M411	Improving the competitiveness of the agricultural and forestry sector	8,565,135	99.34
M412	Improving the environment and the countryside	401,982	100.76
M413	Quality of life in rural areas and diversification of the rural economy	22,832,884	98.48
M421	Inter-territorial and transnational cooperation	270,000	90.62
M431	Running costs, acquisition of skills and animation	10,640,000	99.99
M511	Technical assistance	31,300,000	97.47
M611	Supplements to direct payments	123,386, 000	99.99
	Total	2,500,837, 172	98.91

Source: [6].

The accumulation of the funds from 2014 to the beginning of 2017 shows that the level of accumulation of the sources is very low (Table 3). The reason is that some of the

measures were started recently. At the same time, some of the Ordinances for implementation of the measures are not developed.

Table 3. Accumulation of the RDP 2014-2020 by measures

	Measure	Budget EAFRD, euro	% accumulation
2.1.1	Consultancy, farm management services and farm replacement	1,414,435.01	55.82
4.1	Support for investments in agricultural holdings	160,429,966.25	17.47
4.2	Support for investment in the development of agricultural products	111,654,565.91	1.98
6.3	Start-up support for the development of small farms	26,487,115.25	17.33
6.1	Start-up support for young farmers	35,208,977.91	72.98
8.1	Investments in the development of forest areas and improvement of the viability of forests	3,534,785.77	5.50
9	Creating producer groups and organizations	3,587,458.84	0.65
10	Agroecology and climate	85,647,817.77	25.35
	Agroecology and climate		
11	Organic Farming	58,132,262.50	18.97
213	Payments on "Natura 2000" and the Water Framework Directive	47,092,626.04	39.25
12	Natura 2000		
13	Payments to areas facing natural or other specific constraints.	93,161,938.85	35.04
19.1	Leader	2,193,372.53	9.53
20	Technical Assistance	19,170,300.64	16.22
	TOTAL	**647,715,623.27**	**22.96***

Source: [6].

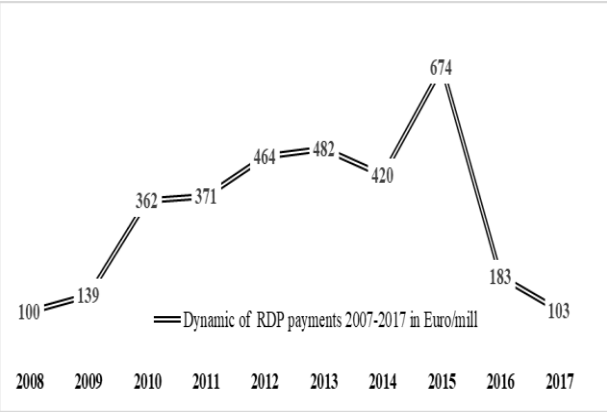

Fig. 6. Dynamics of RDP payments in Bulgaria 2007-2017 in million EUR
Source: [6].

In Bulgaria the payments from the program are connected to the budget of the program (Figure 6).

The lowest numbers are observed in 2008 which is the year when the first payments arose and in 2017, when the levels are around euro 1 million.

The most successful period was 2015, when the two periods were the payment of the two periods were applicable.

ARDL model for 2007-2013 and 2014-2017

For the purpose of the study an ARDL model was developed for social characteristic of farmers [7]. The model analyses GVA in agriculture and is based on the following variables:

-Gross value added in agriculture (BGN million) – Data for the period of 2006-2017 from NSI were collected. Nominal values are deflated by the consumer price index, and then converted to logarithms.

-Average land sales price (BGN/dka) – data for the period 2006-2009 are taken from [2], and data for 2010 to 2017 are from the NSI. The price of the land has been transformed first in real values, then below the logarithm as well Gross value added in agriculture.

-Dummy – has a value of 0 for the period from 2008 to 2013 and a value of 1 for 2014-2017. The Dummy reflects the two sub-periods of the Rural Development Program: the first period – 2008-2013 and the second period 2014-2017.

Analyzed are variable in terms of whether they are stationary or not. Table 4 shows Augmented results of Dickey–Fuller unit root test and Phil-lips–Perron test.

Table 4. Augmented results Dickey–Fuller unit root test and Phillips–Perron test

Time series	Augmented Dickey–Fuller unit root test (probability); (maximum number of lags)	Phillips–Perron (probability)
ln_Pl	I(1) (0.0089); (3)	I(1) (0.0236)
ln_Gva_agr	I(1) (0.0325); (2)	I(0) (0.0011)

Source: adapted by [8], [9].

Table 4 found that the variables are not stationary at the level according to Augmented Dickey–Fuller unit root test. They are stationary at first difference. According to

and Phillips–Perron test ln_Gva_agr is stationary at the level.

The basis on which the model is developed is the following:

ln_GVA_agr = c0 + c1ln_Pl + e .....(1)

where:

ln_GVA_agr – is GVA from agriculture,

ln_Pl – is the price of the land,

c0 – is the constant of the model,

e – random error.

The studied ARDL model has the following expression:

$$d(\ln\_GVA\_agr)_t = c_0 + c_1 d(\ln\_GVA\_agr)_{t-1} + c_2 d(\ln\_Pl)t + c_3 Du + + c_4 \ln\_GVA\_agr_{t-1} + c_5 \ln\_Pl_{t-1} + u_t \quad .....(2)$$

where:

d – first difference,

Du – dummy variable,

co – constant of the model,

c1 and c2 – short-term coefficients,

c3 – coefficient in front dummy variable,

c4 and c5 – long-term coefficients,

ut – random error of the model.

Long-run relation between the variables was checked with Wald coefficient test, in which the H0 was c4=c5=0.

The F-statistics of Wald test was compared with the critical bonds at 5% significance level of Pesaran, Shin and Smith [15].

Table 5 shows the estimations of the model D(ln_GVA_agr). The study found that F – statistics of Wald test is 2.16, which is below lowed bond of Pesaran, Shin and Smith [15].

Table 5. Model estimations

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(ln_GVA_agr(-1))	-1.298844	0.318501	-4.078	0.0151
D(LN_Pl)	1.286525	0.260301	4.942451	0.0078
Du	0.010772	0.072073	0.149456	0.8884
Intercept	-5.223167	2.467725	-2.11659	0.1017
ln_GVA_agr(-1)	1.212078	0.58883	2.058453	0.1086
LN_Pl(-1)	0.092327	0.100603	0.917733	0.4107
Diagnostic tests and goodness of fit of the ARDL model for D(LN_GVA_AGRI)				
R^2	0.952708	Adjusted R^2	0.893593	
F-statistic	16.11617	Probability of F-statistic	0.009326	
Breusch–Godfrey Serial Correlation Test (probability)	0.2014	CUSUM test	the graphics is within the 5% boundary interval	
ARCH Heteroskedasticity Test (probability)	0.3186	CUSUMSQ test	the graphics is within the 5% boundary interval	
Jarque–Bera test (probability)	0.662197			

Source: adapted by [8], [9].

Therefore, there is no long-term cointegration between the variables in the model. For this reason, the model has been modified by removing the long-term variables, i.e. the publication will only review the short-run ARDL model for D (LN_GVA_AGR). The model has the following form:

$$d(\ln\_GVA\_agr)_t = c_0 + c_1 d(\ln\_GVA\_agr)_{t-1} + c_2 d(\ln\_Pl)t + c_3 Du + u_t \quad .....(3)$$

Table 6 shows the estimation of short-run ARDL model for D(LN_GVA_AGR). We can conclude that all variables have had significant impact on gross value added of agriculture except dummy variable. Consequently, in terms of GVA_agr, there is no significant difference between the two subperiods of the studied RDP.

Land price ratio is a positive number, which means that with the in-crease in the real price of land, the gross value added from agriculture also increases.

Table 6. Estimation of the short-run ARDL model

Variable	Coefficient	Standard Error	t-Statistic	Probability
D(ln_GVA_agr(-1))	-0.671545	0.118553	-5.66451	0.0013
D(LN_Pl)	0.816049	0.150804	5.411317	0.0016
Du	0.060022	0.039945	1.502593	0.1836
Intercept	-0.109611	0.0316	-3.4687	0.0133
Diagnostic tests and goodness of fit of the short-run ARDL model for D(LN_GVA_AGRI)				
R^2	0.901709	Adjusted R^2	0.852563	
F-statistic	18.34773	Probability of F-statistic	0.001999	
Breusch–Godfrey Serial Correlation Test (probability)	0.5396	CUSUM test	the graphics is within the 5% boundary interval	
ARCH Heteroskedasticity Test (probability)	0.1532	CUSUMSQ test	the graphics is within the 5% boundary interval	
Jarque–Bera test (probability)	0.725968			

Source: adapted by [8], [9].

CONCLUSIONS

(i)Based on the data of the statistics and the conclusions of the literary review it can be concluded that RDP has contributed and helped to:
-increase labour productivity;
-improve continuity and rejuvenation of the agricultural sector;
-create sustainable employment;
-increase mechanization in the sector;
-renovate the machinery-tractor park;
-implement innovation;
-increase areas and products with organic production;
-improve infrastructure in rural areas.
(ii)The effects of the programme are also reflected in an improved quality of life in rural areas.
(iii)In the first programming period the change of GDP in agricultural sector is higher than in the second period, where the levels can be described as a stable with very low fluctuation.
(iv)In the new programming period and the new framework some simplifications of the measures have been introduced in terms of their number and flexibility.
(v)The level of assimilation of the RDP for the period from 2007 to 2013 is high-reaching 90% for almost all of the measures and for the period of 2014-2017 is low due to the fact that some of the measures were launched recently and some of the implementing Ordinances have not been developed yet.
(vi)According to the ARDL model there is no significant improvement between the two program periods of RDP.
The allocation of funds is not reflecting that GVA differently between 2007-2013 and 2014-2017.
(vii)Future policy should follow the lines to reach:
-rejuvenating the sector;
-decent income from agricultural activities;
-improving the prestige of the sector;
-implementing policies according to the new model of farming activities aimed at environmental protection;
-supporting and promoting diversification and multifunctional production activities;
-helping to increase knowledge in the field of agriculture and the application of innovative practices;
-flexibility in addressing measures to move them into ones that would deliver a sustainable outcome for the whole sector and improve the quality of life in rural areas.

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REFERENCES

[1]Atanasova–Kalajdjieva, T., 2010, Problems in rural development. Man-agement and sustainable development. No. 3-4(27), pp. 212-217.
[2]Bachvarova, S., 2013, State and trends in the development of the land market in Bulgaria–2012. Retrieved from: http://www.mzh.government.bg/media/filer_ pub-lic/2018/02/23/pazar_zemia_2012.pdf
[3]Baldock, D., Dwyer, J., Lowe, P., Petersen J., Ward N.,2001, The na-ture of rural development: towards a sustainable integrated rural policy in Europe. IEEP.
[4]Carels, K., Clercq, P., Gijseghem, D.,2005, Impacts of Agricultural Pol-icy on Rural Development in Belgium: case study of the Flemish Region. OECD workshop Evaluating Agri-environmental Policies Bratislava, 24-26 October 2005.
[5]Corral, S., Díaz, A., Monagas, M., García, E., 2017, Agricultural policies and their impact on poverty agricultural policies and their Impact on Poverty Reduction in Developing Countries: Lessons Learned from Three Water Basins in Cape Verde. Sustainability, 9(10), pp. 1841-1858.
[6]GFA, 2017, Assimilation of the European Agricultural Funds. Statistical data 2007-2016.
[7]Harizanova-Metodieva, Ts., Metodiev, N.,2013, Social characteristic of farmers according to different factors. Agricultural science, 46(3-4), pp. 26-31.
[8]Harizanova–Metodieva, T., Metodiev, N.,2016, Determining the number of occupied persons, needed by dairy cattle farms in Bulgaria. Scientific Papers: Management, Economic Engineering in Agriculture & Rural Development, 16(4), pp 149-152.
[9]Harizanova–Metodieva, T., Metodiev, N., 2019, Structure of investment costs of dairy sheep breeding farms in Bulgaria. Scientific Papers: Management, Economic Engineering in Agriculture & Rural Development, 19(1), pp. 223-227.
[10]IAMO, 2004, The Role of Agriculture in Central and Eastern European Rural Development: Engine of Change or Social Buffer? Volume 25. Ed-ited by Martin Petrick and Peter Weingarten. IAMO publishing.
[11]Korf, B., Oughton, E., 2006, Rethinking the European Countryside – Can We Learn from the South? Journal of Rural Studies, 22(3), pp. 278–289.
[12]Koteva, N., Atanasova-Chopeva, M.,2011, The role of small farms in the context of European integration. Economics and Management of Agriculture, 56(5), pp. 33-43.
[13]National Statistical Institute, 2017, Statistical Yearbook 2017, Main Macroeconomic Indicators, Publications, Library and Digital Products Department.
OECD, 2010, Agricultural policies and rural development – a synthe-sis of recent OECD work. OECD publishing.
[15]Pesaran, M., Shin, Y., Smith, R., 2001, Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics 16(3), pp. 289-326.
[16]Yarkova, J., Grozeva, R., Hainboazki, N., 2009, Local Administra-tion in Rural Areas: Potential and Challenges in the New Paradigm of Development. Economic alternatives 3, pp. 85-98.