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**PROJECT „ENVIRONMENTAL MANAGEMENT ENHANCEMENT BY YOUTH-RUN
SMES“ ENVIRONMENTYOU /INTERREG V-A Greece - Bulgaria 2014-2020**

PROJECT REPORT

on

STUDY AND ASSESSMENT OF THE STATE OF THE MAIN SOCIAL, ECONOMIC AND ENVIRONMENTAL PROBLEMS OF THE AGRICULTURAL SECTOR IN THE CROSS-BORDER BORDER OF GREECE AND BULGARIA AND THE ROLE OF THE YOUNG PEOPLE IN SOLVING THESE PROBLEMS

Sofia, September 2020

ABBREVIATIONS

AAQ Atmospheric air quality

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AAMAAQ	Areas for assessment and management of ambient air quality
AAN	Average annual norm for protection of human health
AAPA	Atmospheric Air Purity Act
ADN	Average daily norm for protection of human health
AEAV	Act for establishing an administrative violation
AHN	Average hourly norm for protection of human health
AM	Highway
AMS	Automatic measuring station
AWU	Annual work units
BAS	Bulgarian Academy of Sciences
BC	Border checkpoint
BOD ₅	Biological oxygen demand for 5 days
BSS	Bulgarian State Standard
CBS Rojen	Complex background station ROJEN
EABD	East Aegean Basin Directorate
EEA	Executive Environment Agency
ELV	Emission limit values
ELVs	End-of-life vehicles
EMEPA	Enterprise for management of environmental protection activities
EPA	Environmental Protection Act
EU	European Union
GHGEP	Greenhouse gas emissions permit
GWB	Groundwater bodies
IEL	Individual emission limits
LWWTP	Local wastewater treatment plant
MAC	Maximum Allowable Concentrations
MCP	Medium combustion plants
MAS	Mobile automatic station
MWWTP	Municipal wastewater treatment plant
NIHM	National Institute of Hydrology and Meteorology
NSI	National Statistical Institute
NGO	Non-governmental organization
PAH	Polyaromatic hydrocarbons
PGA	Permanently grasses areas
PD	Penalty Decree
PM _{2.5}	Fine dust particles up to 2.5 micrometers in size
PM ₁₀	Fine dust particles up to 10 micrometers in size
RBMP	River basin management plan
RIEW	Regional Inspectorate of Environment and Water
SAPARD	Special Accession Programme for Agriculture and Rural Development

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SG	State Gazette
SSMP	Standard set of meteorological parameters
STTN	Short-term target norm
TIP	Threshold for informing the population
TF	Treatment Facility
UBA	Unusable batteries and accumulators
UNFCCC	United Nations Framework Convention on Climate Change
UAA	Used Arable Area
VOC	Volatile organic compounds
WABD	West Aegean Basin Directorate
WMA	Waste Management Act
WWTP	Wastewater treatment plant

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BLAGOEVGRAD REGION

1.1. GEOGRAPHICAL LOCATION

Blagoevgrad Region is located in the southwestern part of the territory of the Republic of Bulgaria. It is located between Kyustendil, Sofia, Pazardzhik and Smolyan regions and the state borders with Greece and Republic of North Macedonia. The total area of the region includes the valleys of the rivers Struma and Mesta, Pirin Mountain, as well as parts of the mountains Rila, Rhodope, Slavyanka, Belasitsa, Ograzhden, Maleshevska and Vlahina.

Blagoevgrad Region is part of the Southwest Planning Region (NUTS 2 level). The territory of the region covers 6452.3 km², which represents 5.8% of the country's territory. Administratively, the region is divided into 14 municipalities, 96 town/city halls and 280 settlements.

1.2. NATURAL CHARACTERISTICS OF THE TERRITORY

1.2.1. RELIEF

Blagoevgrad region is characterized by exceptional diversity of relief. It includes in whole or in part the highest mountains in our country - Rila, Pirin and Rhodope, in which there are areas with alpine, mid-mountain and foothill relief. The territories of Vlahina, Maleshevska, Ograzhden, Belasitsa and Slavyanka mountains are with a lower height, but with mountainous relief.

1.2.2. WATER

The water resources of the region are formed by the main drainage arteries Struma and Mesta and their numerous tributaries - Blagoevgradska Bistritsa, Pirinska Bistritsa, Lebnitsa, Strumeshnitsa, Belishka River, Demyanitsa, Kanina, Bistritsa, Tufcha, etc., as well as over 160 circus lakes in Pirin, and karst springs in Pirin and Slavyanka.

1.2.3. CLIMATE

The climate has a strong Mediterranean influence along the Struma, Strumeshnitsa and Mesta rivers. This determines suitable conditions for growing a large number of heat-loving Mediterranean plant species, unlike other regions of the country. The conditions for irrigation and reclamation in the river valleys are good. The soil conditions are good for growing tobacco, vineyards, orchards, heat-loving crops, herbs, mushrooms and more. Particularly typical for the

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region are the long summer droughts in the lowlands, and the precipitation is below the national average and is unevenly distributed by seasons and months.

1.2.4. ENVIRONMENT

The indicators for environmental quality assessment in Blagoevgrad region remain without significant change. It generates a relatively smaller amount of household waste - 345 kg / person per year, and for a decade this value has gravitated to about 350 kg. However, the population with access to wastewater treatment plants decreased to 29.6% compared to 63.4% for the country as a whole. The share of the population with access to sewerage is higher and growing - 81.9%, compared to 76% for the country, and in terms of air quality, measured by carbon dioxide emissions, the region is in sixth place in the country with only 10 tons / sq.km.

1.3. ECONOMIC DEVELOPMENT

1.3.1. INCOME AND LIVING CONDITIONS

In the last five years there has been a significant increase in GDP per capita in Blagoevgrad region. However, the value of this indicator remains significantly below the national average per capita. There is an increase in the average salary of employees, which has increased by over 8% in 2017, however, the level of salaries in the region remains significantly below the national average. The relative share of the population living in material deprivation is lower than the national average, but at the same time 26% of the population in the region is below the poverty line, compared to 22% for the country. The average income per household member covers 93% of the national average.

1.3.2. LABOR MARKET

Although the overall assessment of the labor market is positive compared to other areas, in 2018, the unemployment rate rose to 4.8%. Against the background of slightly rising unemployment, the employment rate of the population aged between 15 and 64 has reached 71%, which is a record for the region. The region ranks third after Sofia and Smolyan in terms of economic activity - 75%.

The demographic replacement rate of 15–19 versus 60–64 years (63.8%) is slightly below the national average, which means that in the near future the labor force will shrink faster than in other areas. At the same time, the relative share of able-bodied persons with higher education remains low (20.7%) despite there is a slight improvement compared to the previous year.

1.3.3. INDUSTRY

The municipalities of Blagoevgrad region are characterized by strong polarization in terms of industrial development. The industry is unevenly distributed throughout the region. The tendencies in its development in the different municipalities are also different. More than 50% of the processing industry is concentrated in the municipality of Blagoevgrad. Industry is diversified with a significant decline in structure-determining industries in recent years. The

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changes in the structure are aimed at reducing and even eliminating the share of strategic, high-tech and science-intensive industries at the expense of traditional industry. The largest contribution to the volume of production and the number of jobs is made by industry, followed by trade and transport. Leading are mechanical engineering and electronics. The textile, the knitwear and clothing industry are traditionally one of the main and most important sectors for the industrial development of the municipality. Characteristic of the clothing industry is that the main market of the industry's products (mainly toll) are mainly customers from Germany and Italy. The food industry is also highly developed, including activities related to the production and processing of meat, processing and canning of fruits and vegetables, production of vegetable and animal fats, production of milk and dairy products, mill products, prepared animal feeds, bread, bakery and confectionery, prepared foods, pasta, soft drinks and alcohol. are mainly customers from Germany and Italy.

1.3.4. INVESTMENTS

In 2017 the number of non-financial enterprises in the region has slightly increased, reaching 70 per 1,000 people. This puts Blagoevgrad in fourth place on this indicator and well above the average level. However, the region does not enjoy particularly large investments. Blagoevgrad is among the leaders in the absorption of funds from European funds / 2132 BGN per capita /, the reason for which is mostly the construction of the Struma highway. Among the indicators with better dynamics is the production per capita, however, it remains below the national average.

1.3.5. INFRASTRUCTURE

In recent years, there have been no major changes in the state of the infrastructure in the area. The share of motorways and first-class roads remained at 13.8% in 2017 of the common road network of the region. Slight improvement is observed in the percentage of roads in good condition. In 2018 with the commissioning of part of the Struma highway / Kresna-Sandanski section /, the percentage of roads in good condition significantly improved to 62.5%. The density of the road and railway network in the region remains unchanged, and according to both indicators Blagoevgrad is in the last place in the country, which is largely due to the large share of mountainous territory.

1.4. SOCIAL DEVELOPMENT

1.4.1. DEMOGRAPHIC CHARACTERISTICS

Despite the negative demographic trends in the country, Blagoevgrad region achieves relatively good results. The coefficient of natural growth reports a minimal improvement, which reaches -4.5 ‰. It is not a trend, because in previous years the difference between mortality and birth rate has been deteriorating. On the other hand, the mechanical growth in the region is lower than in the country -4.5 ‰, which means that the share of emigrants from the region is significantly higher than the settlers.

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The share of urban population is slowly rising, however, it is well below the national average due to the geographical features of the region. At the same time, the population density in urban areas is among the highest in the country. The age dependency ratios are deteriorating, although they are not the most unfavorable in the country.

1.4.2. EDUCATION

Blagoevgrad University is of great importance for the educational system in the region. It is in the sixth place in number of students / 31 for every 1000 people /. However, this indicator is gradually declining, which indicates a decline in interest in the school. Blagoevgrad region is doing better than most regions in the country in keeping students in school, but there is also a low share of dropouts from primary and secondary education.

1.4.3. HEALTH

The number of general practitioners in the region is declining. However, the coverage of the health system is better than in most areas, and the number of health insured people has risen to 89%.

1.4.4. CULTURE

Blagoevgrad is doing relatively poorly in the field of culture. Cinema visits per 1,000 people in 2018 were 363 - half the national average, but this indicator has reached a gradual increase over the last decade. On the other hand, visits to theaters are declining. Museums and libraries are more popular, but even here the area remains well below average.

1.5. AGRICULTURE

1.5.1. PLANT GROWING

The specialization of the region in the plant production of the country is determined by the production of tobacco, potatoes, tomatoes, peaches, grapes.

The arable land amounts to 155,091 decares or 27% of the UAA. The largest share of arable land is occupied by cereals 38%, and technical crops are 24%. The largest relative share of cereals is wheat, which occupies 57%. From all technical crops, the share of tobacco is the largest - 92% or 33,712.5 decares, which is 14% of the area with tobacco in the country. Potatoes occupy 3% of the UAA or 14% of the potato area in the country. They are concentrated in the municipalities of Yakoruda, Satovcha, Petrich and Gotse Delchev. Fresh vegetables occupy 6% of the area with vegetables in the country, and the areas with vegetables grown under tall greenhouses are 22% of all greenhouses. The permanent crops in the region occupy 51,634 decares. (8.8% of the UAA), with the largest areas of vineyards - 34,994 decares. (68% of perennials in the region).

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Peaches and nectarines are 5,279 decares, apples - 5,187 decares, cherries - 1,952 decares, plums - 1,474 decares. The positive trend of development of organic farming continues.

On the territory of Blagoevgrad region localities of herbs of commercial importance are not known, except for St. John's wort, oregano, thyme, yarrow and others. Attempts are also being made to grow herbs for commercial purposes by private farmers who grow lavender, white oregano, echinacea and others.

1.5.2. LIVESTOCK

The development of animal husbandry in Blagoevgrad region is favored by climatic and natural resources. The high relative share of the permanently grassed areas on the territory of the region creates excellent conditions for the development of pasture animal husbandry.

Most of the animals in the region are grown by the private sector. Large part of the animal production is not commodity in nature and remains to cover the needs of producers and their families. About 35-40% of the milk produced and over 46% of the meat produced do not reach the market.

The growth potential of the sector is related to the opportunities for development of pasture animal husbandry with dominance of the processing sector and production of certified ecologically clean products. It is necessary to promote competitiveness by increasing productivity, increasing the pace of technical renewal and innovation.

Blagoevgrad Region ranks first in the country in the number of small cattle raised.

In the region in 2018 are grown about:

- 27% of the goats;
- 11% of the sheep;
- 8% of the cattle in Bulgaria.

The region ranks first in the production of goat's milk and third in the production of sheep's milk, after the regions of Burgas and Plovdiv.

Between 2014 and 2018, the number of sheep in the region increased by 8%, cattle by 26%, pigs by 56% and poultry by about 3%.

The most significant increase is the number of buffaloes, which raised by about ten times. The produced buffalo milk increases more than four times. The number of animals of this species applied for direct support in 2018 is almost fourteen times more than in 2014.

The main prerequisite for good development of pasture livestock in the Blagoevgrad region is the large share of permanently grassed areas (PGA). They are 76% of the UAA for the period 2014 - 2018. Their share represents nearly 10% of all applications for financial support by EU for PGA in the country.

The agricultural sector is important for the economy of Blagoevgrad region.

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It forms nearly 9% of the total Gross Added Value created by all industries in the region in 2018. For the current EU funded programming period, farmers in the region have received financial support amounting to BGN 584.7 million. This represents about 4% of the total provided public financial resource in agriculture.

SMOLYAN REGION

1.1. GEOGRAPHICAL LOCATION

Smolyan Region is located in Southern Bulgaria in the central part of the Rhodopes on a territory of 3,192.9 sq. km or 2.9% of the country's territory. It has a common border with the regions of Plovdiv, Pazardzhik, Kardzhali and Blagoevgrad, and to the south the regional border coincides with the state border of Greece. The altitude of the region is from 450 to 2,191 m. Administratively the region is divided into 10 municipalities, 103 town/village halls and 242 settlements. Forests cover a large part of the territory - 2,093 thousand decares (66%), and agricultural lands occupy 851 thousand decares (27%). Forest vegetation is represented by deciduous forests - in the lower parts and coniferous forests in the higher parts.

1.2. NATURAL CHARACTERISTICS OF THE TERRITORY

Smolyan region is characterized by preserved clean natural environment, which is one of the specific advantages, and the other is the availability of natural resources - ore, mineral water, forest areas.

1.2.1. RELIEF

The territory of the region is characterized by mountainous terrain, but in different municipalities it has different manifestations. The average altitude of the region ranges between 450 and 2,191 m, which has an impact on the overall socio-economic, settlement and infrastructural development.

1.2.2. WATER

Due to the high altitude, heavy rainfall, long-term snow retention and especially the presence of tall trees, the area is characterized by its richness of water resources: rivers, dams, karst and mineral springs.

The longest rivers in the region are: Arda / 241.3 km /, Vacha / 111.5 km / and Chepelarska river /85.9 km/. The rivers Arda, Vacha and Chepelarska pass through the region, but the main water resources come from the Smolyan lakes and from the mineral springs in Devin, Mihalkovo, Beden and Banite.

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Both surface waters /rivers and dams/ and groundwaters /fresh and mineral/ are situated in Smolyan region. The first stage of the water power cascade “Dospat - Devin - Krichim” (“Dospat - Vacha”) was built in the region - part of which is the hydroelectric dam Dospat.

An important hydrological resource for the area are the mineral springs. Devin is best known for the wonderful properties of its mineral water. Its temperature at the individual springs is between 37-42 ° C. Municipality Banite is the also a balneological center, which is located in the eastern part of Smolyan region. In the center of the village of Banite was discovered a hot mineral spring, which according to a legend dates back to Roman times. The water has a temperature of 35 - 43 ° C. The mineral water contains nitrogen, hydrocarbons, sulfate, sodium, potassium and fluorine compounds.

1.2.3. CLIMATE

The territory of Smolyan region covers a belt with a predominantly mountainous climate, which in the southeastern parts of the region is transitional Mediterranean. It is characterized by mild and snowy winters and cool summers. The region is characterized by mild snowy winters, cool springs, summers without extreme heat and relatively warm and long autumns, formed by the altitude and the direct impact of the nearby Aegean coastal lowlands. Precipitation is relatively irregular, there is a pronounced winter and spring-summer precipitation maximum.

1.2.4. ENVIRONMENT

The analysis of the environmental protection confirms the conclusions that the clean natural environment is one of the specific advantages of the area. However, this positive side is not fully and comprehensively exploited.

Air - An increase in the norms of PM10 has been reported, and the main sources for this are: industry, transport, energy and domestic heating. During the heating season, the main source of air pollution with PM10 is the combustion of solid and liquid fuels in the home and winter sanding. The reason for the significant number of elevations are the geographical location of the city and the specific meteorological conditions / low wind speed, presence of inversions, etc./

Waters - The water pollution in the water intakes occurs mostly after the discharge of wastewater from larger settlements and municipal centers with over 70% sewerage network and the presence of a collector. In the municipal centers the construction of a sewerage network and collection collectors continues to the sites designated for the construction of Municipal Waste Water Treatment Plant (WWTP).

There are 48 protected areas on the territory of the region.

In Smolyan region, almost all settlements have waste collection and disposal, with the exception of settlements with difficult access and a population of less than 20 people. Despite the inspections of the RIEW, it was established that part of the population continues to dump waste on the slopes to roads, ravines and rivers.

1.3. ECONOMIC DEVELOPMENT

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1.3.1. INCOME AND LIVING CONDITIONS

In recent years, there has been a slight increase in the average annual income per household member, with the main part of this income being received in the form of income from wages, pensions, social benefits, child benefits, as well as income from entrepreneurship and sale of property.

The share of social incomes in the region is increasing, which indicates a growing dependence of the population on the social protection system. The share of household income is high, which reflects a tendency towards naturalization of income and economic closure of households in the region. The purchasing power of the inhabitants is severely limited. There is a typical for the country increase in the share of food expenditures, which is a significant indicator for the impoverishment of the population and placing a large part of it in a regime of "physiological survival".

1.3.2. LABOR MARKET

Smolyan region has either the highest unemployment or values close to the most alarming levels. The difference between the reported minimum and maximum average monthly unemployment rate in the regions of Smolyan and Sofia-city is 17.6 percentage points. This is due to disparities in the socio-economic development of individual areas, determined by the action of various natural, socio-demographic and economic factors.

One of the biggest problems characterizing the economic development of the region is the high unemployment rate and the real lack of good opportunities for alternative employment in the region. The tendency to increase the percentage of unemployed is a fact, as the region is one of the leading places in this regard. Smolyan continues to be the least economically developed region compared to the other regions of the South Central Planning Region.

1.3.3. INDUSTRY

The light industry is developed in the region, represented by textile, tailoring and dairy processing enterprises, enterprises for production of bread, bakery and confectionery products. Potato production is the main product of crop production in the region of Smolyan municipality. The tourism is a priority sector and the offers excellent conditions for this.

57% of the companies in Smolyan region have a profit in 2010. The companies ended 2010 with a positive financial result - a profit of BGN 5 million. 57% or 3,057 enterprises and companies with a total positive result of BGN 77 million ended with a profit. 1,354 companies or 25.3% of the companies have a total loss of BGN 72 million. 17.7% or 948 companies have zero financial result. The most profitable are the medium-sized enterprises, in which the number of employees is between 50 to 249. The final financial result realized by them is a profit in the amount of BGN 16 million. The biggest losers are the small enterprises with number of employees between 10 to 49. The small enterprises realized a loss with final financial result in

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the amount of BGN 11 million.¹42.4 per cent of the net sales revenues realized in the region are from the economic activity “Manufacturing”. 24% of the revenues were realized in the activity "Trade: repair of motor vehicles and motorcycles", and 8.7% - in the activity "Construction". The production amounts to BGN 821 million.

Small business, developed by enterprises with a staff of no more than 9 employees, is the basis of the non-financial sector of the regional economy. It accounts for the predominant share of 92.2% of all non-financial corporations in 2010.²

1.3.4. INVESTMENTS

Foreign direct investments in enterprises from the non-financial sector in Smolyan region as of 31.12.2018 amount to 90.6 million Euros, which is 9.3% more than in 2017. The value of the direct foreign investments is highest in industry and real estate operations. In 2018 The largest share of foreign investments in the region has the municipality of Smolyan /30% of all investments in the region/. Smolyan Region ranks 23rd in the country in terms of value of the direct foreign investments.

1.3.5. INFRASTRUCTURE

Due to the specific natural conditions, road transport is the only type of transport in Smolyan region. The service of the population with passenger, freight and taxi transport is carried out entirely by private companies. The passenger transport in the region is very well organized and functioning. The municipal and regional transport schemes fully satisfy the needs of the population. There is a relatively well-developed road network in Smolyan region. The total length of the roads is 1256 km. Due to the peculiarity of the terrain in the area there are no first class roads.

Smolyan Region is the only one without access to the railway network.

1.4. SOCIAL DEVELOPMENT

1.4.1. DEMOGRAPHIC CHARACTERISTICS

The difficult socio-economic situation in combination with the low birth rate, high mortality and emigration will lead to the continuation of the process of depopulation of Smolyan region. The development of these basic demographic processes will in the future lead to a reduction in the income of young generations in the able-bodied contingent and an increase in the demographic burden of the working population, mainly due to the growth of the number of elder people. The population of the municipality is expected to continue to decrease in the next 10-15 years, on average by 1% per year.

¹ The data from the Development Strategy of Smolyan Region 2014-2020 are from 2010.

² The data from the Development Strategy of Smolyan Region 2014-2020 are from 2010.

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1.4.2. EDUCATION

In quantitative terms, the crisis in education is expressed in the closure of schools and classes and in reducing the number of students and staff. These processes are also characteristic of the national education system. The main reasons for the decline of the educational system in the region are: the declining number of children; poor financial condition of the municipality, which are not able to maintain the existing network of schools; migration; depopulation and aging. The territorial organization and the quality of the educational process are influenced by two specific features of the region - the geographical and infrastructural characteristics. The settlements in the region are located at an altitude of 800-1000 m and are often far from the municipal center. The mountainous terrain is heavily rugged and most of the roads are not paved. The duration of the winter period is about 5 months a year. Under these circumstances, the transport of students to schools is extremely difficult or even impossible. As a result, small and merged classes are formed, which leads to a decrease in the quality of the learning process.

Healthcare

The provision of general practitioners is 6.4 per 10,000 population, which is the national average. There is a decrease in the total number of physicians compared to previous years.

A serious problem is ensuring a normal access to medical services for part of the population of the region. Additional funds, existence and functioning of hospitals have to be assured in smaller populated areas, taking into account the mountainous nature of the region.

1.4.3. CULTURE

In the process of economic crisis, one of the most affected areas is the spiritual and cultural one. The Municipality of Smolyan maintains a rich cultural calendar, full of various events, which is a natural addition to the tourism sector. The main problems are related to the financing and organization of cultural events, the difficult maintenance and preservation of cultural and historical monuments and buildings. Cultural institutes and community centers are funded by municipal budgets and subsidies from the Ministry of Culture. A common problem for the cultural and historical heritage in the region is the insufficient care for the maintenance of the cultural monuments due to the lack of funds and appropriate mechanisms. In this regard, investments are needed for the reconstruction, repair and delivery of equipment for cultural centers, theaters, community centers, libraries and other objects related to cultural life. Alternative sources of funding need to be sought.

1.5. AGRICULTURE

1.5.1. PLANT GROWING

The existing specific soil and climatic conditions are suitable for growing mainly potatoes, oriental tobacco, fodder crops, as well as strawberries, raspberries, essential oils and medicinal plants in some settlements. All other crops in the municipalities are grown for personal consumption and have no economic significance.

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Potato production in the area is the most common plant production and has very favorable conditions for development, given the soil and climatic conditions and the experience of the population for growing, harvesting and storing potatoes, not least also due to the inertia of thinking. Potato production is an opportunity for the survival of individual households and is a significant source of cash within municipal economies. The analysis shows that if there are initiatives to find and offer domestic market for the produced potatoes, especially given their high quality, the problem of their growing is solved. An increase in potato production has been achieved, but there are negative factors, such as non-sanctioned imports from abroad, as well as the lack of good organization for their market realization, both within the country and abroad. In recent years, there has been a tendency to reduce the area planted with potatoes and significantly reduce the average yields. The reasons for this are complex, but must be sought primarily in the high cost and increasingly difficult market realization of production, deteriorating quality of planting material and varietal composition, extensive agriculture with a predominance of manual labor.

Tobacco is the second most important agricultural crop grown in the Smolyan region. For the municipalities located in the eastern half of the region it is the main livelihood of the population and has economic significance. At the same time, it is extremely dependent on nature and climatic conditions and especially on the economic conjuncture.

There are about 3,500 tobacco growers in the region, who produce nearly 1,500 tons of tobacco.

In Smolyan district there are favorable natural conditions for the growing of berry crops. In recent years, there has been a tendency to increase the area for growing, especially of strawberries. In addition, the local population has gained significant production experience in growing these crops. Proof of this are the significant areas (200 ha) of berry crops grown 15-20 years ago. This production is in great demand, the crops are more suitable for organic and ecological farming than potatoes. They are sold at a good price, but due to the perishability of the fruits, the lack of refrigeration facilities and good organization for their fast purchase, the areas are still limited. In addition, most berry crops are perennials with a strong root system and protect the soil from erosion on sloping terrain or they have anti-erosion and soil-strengthening role, which is of great importance for the area.

Another possibility in the development of plant growing is the cultivation of essential oil and herbal plants. Mursal tea, lavender, sage, white oregano are grown on small areas in the area. In recent years, more and more farmers in the municipality of Banite grow lavender seedlings in small areas and in their backyards, which are sold in other parts of the country.

Orchards are capital-intensive, but create conditions for long-term, efficient agriculture. The region grows mainly apples. Favorable conditions such as alternative crops are available for apples, plums, walnuts, hazelnuts, cherries. Frozen fruits - cherries, sour cherries, blackcurrants, raspberries, strawberries and some wild fruits - blackberries, blueberries have good opportunities for realization on the western markets. Dried apples and plums are best accepted from all dried fruits.

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Forage production occupies approximately 58% of the arable land in the region. Its development is of great importance as it provides roughage for livestock. In recent years, the average yields of natural meadows have been significantly reduced in terms of their potential. This is mainly due to one-sided fertilization, and often lack thereof.

1.5.2. LIVESTOCK

Cattle and sheep breeding are the main sub-sectors of animal husbandry in the region. The production of unique, quality products in an ecologically clean environment is one of the main and possibly the only competitive direction for the development of animal husbandry.

The cows are raised mainly for dairy production. Nowadays there are currently better conditions in terms of feed resources. The Bulgarian Rhodope cattle is bred in the region, which is extremely well adapted to the agro-ecological conditions, has a lower live weight and lower feed consumption compared to other breeds. On the other hand, it has the highest relative milk yield and the highest concentration and fat content of milk compared to all breeds in the country. These prerequisites make it possible to obtain high quality products: butter, cheese, yellow cheese, cottage cheese and others. In recent years there has been a decrease in the number of cows in the area due to low purchase prices of animal products, high prices of concentrated feed. 97% of the cows in the region are kept on farms with one and two cows. This is the main reason why many producers will find it difficult to meet the European Union's requirements for qualitative milk.

Sheep breeding is a traditional and promising industry for the region, given the favorable conditions of the region and the presence of a large number of alpine pastures. In recent years, the number of sheep raised in the area is relatively constant - about 23,000, but there is a clear trend of larger sheep breeders to increase the number of sheep.

Goats are also raised in the area, but due to restrictive grazing measures, their breeding is difficult.

The number of bee families is about 7 000. The production of honey amounts to 45-50 tons, a small part of which is for sale on the market, and the rest is for personal consumption.

About 200-220 000 birds are bred in the Smolyan region. The largest poultry farm in Southern Bulgaria - "Cocoinpex" is located in the municipality of Smolyan, where the number of birds is about 185,000.

A fish industry has been established in the region / ravines, reservoirs, dams, fishponds /, which are not fully used. Fish production is concentrated in 12 fish farms in the region. Fish for consumption is sold and bait material for fish is produced.

In recent years, breeding of ostriches was tried, but due to the lack of a market for meat, skin and down, this production still cannot find its place in commodity production.

KARDZHALI REGION

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1.1. GEOGRAPHICAL LOCATION

Kardzhali Region covers an area of 3,209.1 km² in the southeastern part of the Republic of Bulgaria, which represents 2.9% of the country's territory. It is located in the South Central region and borders to the west with Smolyan region, to the north with Haskovo and Plovdiv regions, to the south and southeast with the state border of the country with Greece.

The administrative-territorial boundaries of Kardzhali region include seven municipalities - Ardino, Djebel, Kirkovo, Krumovgrad, Kardzhali, Momchilgrad and Chernoochene.

The length of the common border of Kardzhali region with Greece is about 90 km. Its border position is potentially favorable for economic and social development. The location determines the possibility of the area for cross-border cooperation, expressed in the development of trade, tourism, implementation of joint business projects and more. On the other hand, the prospects for development of the region are very much related to the opportunities for integration of Kardzhali region with the neighboring regions and to the creation of preconditions for common use of resources and potential. There is an opportunity to create common tourist products and destinations, joint advertising campaigns, use of shopping malls, logistics centers and border checkpoints in other areas and more.

1.2. NATURAL CHARACTERISTICS OF THE TERRITORY

1.2.1. RELIEF

Kardzhali region occupies most of the Eastern Rhodopes. The relief is predominantly mountainous and semi-mountainous. The highest points in the region are Peak Veikata (1463 m) in the southern part, and in the western part - Peak Alada (1241 m) and Peak Chilyaka (1450 m). The terrain is cut by the upper and middle parts of the Arda River, together with its tributaries, the Varbitsa, Krumovitsa and Perperek rivers. The valleys of these rivers are home to the most fertile lands and the largest settlements. The town of Kardzhali is located along the Arda River, the town of Momchilgrad is located along the Varbitsa River, and the town of Krumovgrad on the Krumovitsa River.

According to the geographical zoning of Bulgaria, Kardzhali region is located in the Eastern Rhodope subregion of Southern Bulgaria and covers the low mountainous hilly relief along the middle reaches of the Arda River. The average altitude is 329 m.

Water

Three of the largest dams in the country have been built on the Arda River - Kardzhali Dam, Studen Kladenets Dam and Ivaylovgrad Dam. The water areas are 2% of the structure of the region. The water outflow of the rivers in the region is characterized by snow-rain regime, high water in autumn-winter and a sharp February maximum. Under the influence of significant spring-summer precipitation, the winter high tide turns into a secondary spring high tide and thus from November to April a general multi-water phase is formed in the river regime, during which 80-90% of the annual runoff volume flows.

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In the spring there is a sufficient amount of precipitation, which provides good soil moisture. From July a relatively dry period begins, best manifested in late summer and early autumn, which lasts until October. The annual amount of precipitation is about 600 liters per square meter.

Near the village of Kirkovo, in the Varnitsite area, there are several mineral water deposits, one of which has been explored and captured.

1.2.2. CLIMATE

The formation of the transitional continental and transitional Mediterranean climate is determined by the nature of the atmospheric transport and the transformation of the air masses on the surface of the relief. The average annual temperature is around 12-13 °C, and the annual precipitation is within 700-800 mm. The region is in the South Bulgarian climatic region and more precisely in the Eastern Rhodope climatic region with a warm Mediterranean influence. Winters are relatively mild. Minimum temperatures during the winter months are relatively high - the average is about 0 degrees. The days with snow retention are 39. The summer is long and hot, with maximum temperatures reaching 39-40 °C and average at about 24 degrees.

During the autumn-winter period, under the influence of Mediterranean cyclones, some of the heaviest precipitation falls. There are two maxima: winter - November, December, January; spring - May, June, July, and a minimum - August, September. Due to the southern position of the area, most of the winter precipitation falls in the form of rain or rain and snow.

1.2.3. ENVIRONMENT

Kardzhali is among the regions with the lowest share of the population in settlements with public sewerage network (45% compared to 76% in the country) and network connected with wastewater treatment plants (39% compared to 63% in the country). At the same time, in 2016 Kardzhali ranked at the forefront in the country as the area with the lowest air pollution with carbon dioxide and with least waste. Harmful emissions on the territory of the region are reduced to less than 4 tons per sq. km, which is tens of times below the national average (281 tons per sq. km). The generated household waste decreases to 211 kg per capita compared to 406 kg per capita in the country.

1.3. ECONOMIC DEVELOPMENT

1.3.1. INCOME AND LIVING CONDITIONS

Kardzhali is among the regions with the lowest gross domestic product per capita and the values in 2016 are no exception, although this is the second year of stable growth. An increase is also observed in terms of salaries and incomes in the region. The average annual gross salary in the region reaches BGN 8,335 compared to BGN 11,379 in the country. However, incomes remain relatively low, ranking Kardzhali among the five regions with the lowest household income in 2017. These processes lead to a reduction in poverty, although it remains relatively high.

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1.3.2. LABOR MARKET

For the second year in a row, there is an increase in the economic activity in the region, but it remains significantly more limited than the national average - 62% compared to 71% in the country for 2017. Only in Lovech region the coefficient of economic activity is lower. The symbolic increase in economic activity is accompanied by a slight increase in employment and a slight decrease in unemployment. The unemployment rate remains the lowest in the country, which is due to weak activity on the labor market, as employment remains among the lowest in the country - 61% compared to 67% in the country. The development of the labor market is also limited by the severely deteriorated educational structure of the labor force. Among the population aged 25-64, university graduates are 14% (twice lower than the national average of 28%),

1.3.3.INDUSTRY

According to the relative share of net sales revenues, in 2011 the weight of the most important sectors in the economy of the region is as follows:

- Manufacturing - 39.92%
- Trade and repair - 33%
- Construction - 9.37%
- Transport and communications - 3.4%
- Agriculture, hunting, forestry and fishing - 3.10%

The services sector is undisputed leader for the region of Kardzhali (51%), as well as for most of the regions in Bulgaria. The agricultural sector occupies a small share of BSS, although it is significantly higher in Kardzali region compared to other regions. At the same time, there is a correlation between the size of the agricultural sector on one hand and the economic development of the region and poverty on the other.

The agricultural sector is declining compared to previous years. Much of the agricultural land is rented or leased (90% of their UAA). The activity is aimed at growing major crops and establishing large livestock farms. The plant growing in the area is dominated by oriental tobacco and has almost monocultural character. Other widespread crops in the area are cereals (mainly wheat and rye), as well as vegetables (mainly potatoes and peppers). Perennials such as vineyards, fruit trees and oilseeds have a small share, but with the potential for expansion. There is a steady decline in animal husbandry, especially pig farming. The beekeeping share has also decreased compared to previous years.

The industry has about 30% share in the BSS of the region. Processing plants use agricultural products as raw materials, and light industry - mainly textile raw materials imported or produced outside the region. Characteristic of the local economy is the concentration of industrial production mainly in the municipal centers and mostly in the municipality of Kardzhali.

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1.3.4. INVESTMENTS

Business and investment activity in the region remain relatively low. Kardzhali continues to be the region with the relatively lowest number of non-financial enterprises - 32 per one thousand people compared to 57 per one thousand people in the country in 2016. The lowest is the share of costs for acquisition of tangible fixed assets - BGN 936 per capita compared to BGN 2,488 per capita in the country, and compared to 2015, there is a widespread decrease in the country, but in the region of Kardzhali it is twice larger. In 2016, there was a slight withdrawal of foreign investment in the region to 1,015 euros per person (against BGN 3,310 per person in the country) after long-term growth. The utilized funds for European projects are increasing, but remain lower than the national average. As of June 30, 2018 the value of the amounts paid to beneficiaries under the operational programs in Kardzhali region reaches BGN 1,089 per person compared to BGN 1,543 per person in the country. Within the region, the municipality of Kardzhali absorbs the most funds (BGN 1,466 per person) and there is not a single municipality that exceeds the national average values for this indicator.

1.3.5. INFRASTRUCTURE

The density of the road network in the region is higher than the national average, but the share of highways and first-class roads is lower, which explains the relatively poor quality of the road surface. Internet access and use in the region are increasing and in 2017 are comparable to the national average.

1.4. SOCIAL DEVELOPMENT

1.4.1. DEMOGRAPHIC CHARACTERISTICS

The natural increase of the population in Kardzhali region has the most favorable value for the country in 2018. Although negative, it is only -3.7 ‰ compared to the national average of -6.5 ‰. The main reason for this is the rate of mortality which is lower than average for the country. The mechanical growth marks a record and in 2018 it is 15.3 ‰. This shows a serious influx of population to the area. The coefficients of age dependence in the region are also more favorable than those in the country. Kardzhali is the least urbanized region in Bulgaria (41.3% of the population lives in cities with an average of 73.6% for the country).

1.4.2. EDUCATION

The net rate of the population in grades V-VIII in the region remains close to the national average in 2017. The share of second-year pupils and the share of those who dropped out of primary and secondary education in Kardzhali region remain below the national average. However, the results of graduates in last year of school in the region are significantly lower than the average. At the graduating in Bulgarian language and literature in 2018, the average success

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of pupils from Kardzhali region is again among the lowest - 3.56 (compared to 4.24 in the country), and the share of poor grades is the highest in the country - 16 % (compared to 6% in the country).

1.4.3. HEALTHCARE

Kardzhali is the area with the most acute shortage of general practitioners in 2017, and this problem is becoming bigger in the last few years. There is one general practitioner 2,475 people in the region, compared to 1,562 people per doctor in the country. The relative number of doctors from the leading specialties is relatively low, and the number of beds in the local general hospitals remains very limited. These factors are intercorrelated. Relatively low number of patients were cured and in 2017, they decreased for the second consecutive year to 164 per one thousand people (compared to 242 per one thousand people in the country), which rather suggests that the population seeks health care outside the region.

1.4.4.CULTURE

The cultural life in the area is slightly intense. In 2017, for the first time, visits to cinemas were reported after a more than 10-year absence in the region.

Despite their low relative number, visits to local museums and libraries decreased compared to 2016. Museum visits are 98 per one thousand people, or seven times below the national average of 722 per one thousand people. The relative number of visits to libraries and those in local theaters is twice lower than the national average.

1.5. AGRICULTURE

1.5.1. PLANT GROWING

The agricultural sector is declining. Much of the agricultural land is given for rent or lease /90% of their UAA/. The activity is aimed at growing basic agricultural crops and large livestock farms. The plant growing in the area is dominated by oriental tobacco and has an almost monocultural character. Other more common crops are cereals (mainly wheat and rye), as well as vegetables (mostly potatoes and peppers). Perennials such as vineyards, fruit trees and oilseeds have a small share, but with the potential for expansion.

The land in the small farms is own and serves mainly for the production of fodder for the raised animals and the cultivation of tobacco and potatoes, and there is no frequent change of ownership. The agricultural production is aimed mainly at satisfying own needs. The potential for agricultural development is limited physically and geographically by the available resources, including the development of the hydromeliorative network. Again, due to the geographical features of the region, the share of arable land is much lower than in other parts of the country.

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The region of the Eastern Rhodopes is suitable for growing stone and walnut fruit species. Fruit growing has a tradition in the Eastern Rhodopes, but have not been developed due to decades of monoculture tobacco cultivation and lack of need for development of alternative agriculture. There is a renewal and establishment of new orchards. The financing under the measures of the Rural Development Program gives a serious impetus to the increase of the areas occupied with fruit crops. Despite the availability of financial resources, the cultivation of fruit crops requires specific knowledge and skills that most farmers lack.

The soil and climatic conditions of the region are a prerequisite for growing technical crops /flax, cotton, peanuts, etc./ and essential oil and herbs for the pharmacy needs /lavender, mint, oil-bearing rose, etc./, as well as some less demanding cereals, like rye.

1.5.2. LIVESTOCK

Livestock is less well represented and occupies a smaller share of the total agricultural production. The mountainous and semi-mountainous relief of the region and the presence of pastures and meadows predispose to the development of sheep, goat and beef cattle breeding.

Mainly cows for milk and meat are raised in the region of Kardzhali. Sheep breeding is well developed also. In terms of the number of cattle, the region ranks second in the country. Sheep farming in the area is a traditional industry. There are two associations of sheep breeders. The industry face a problem with high prices of feed for animals and low purchase prices of live lambs. There are 7 dairies and 3 slaughterhouses on the territory of the region.

From the beginning of 2014 until 2018, the number of poultry in the Kardzhali region increased by 50%, including egg production.

The number of the raised goats and bee families also increased in the region for this period with 12% and 6%, respectively for goats and bee families.

6% of the sheep in the country are bred in the Kardzhali region. In 2018 their number increased by 2% on an annual basis and sheep milk production increased by 5%.

In 2018, nearly 10% of all cattle in the country are bred in Kardzhali region, which ranks it on second place following the Plovdiv region.

HASKOVO REGION

1.1.GEOGRAPHICAL LOCATION

Haskovo Region is located in the southeastern part of the South Central region. It has 261 settlements organized in 11 municipalities: Haskovo, Dimitrovgrad, Harmanli, Simeonovgrad, Svilengrad, Madzharovo, Ivaylovgrad, Lyubimets, Mineralni Bani, Stambolovo and Topolovgrad with a total area of 5543 km². As of February 1, 2011, 246,238 people live in Haskovo Region,

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which represents 3.3% of the country's population. The ten cities of the region are inhabited by 177,778 people, or 72.2% of the population of the region.

1.2. NATURAL CHARACTERISTICS OF THE TERRITORY

1.2.1. RELIEF

The relief of the area is very diverse. The northern and central part is occupied by the Upper Thracian lowland, characterized by extensive riparian lowlands and high groundwater, which favor the intensive use of agricultural land. The flat nature of the relief and the fertile soils have a positive effect on the development of all branches and sub-branches of agriculture, the construction of irrigation systems and transport arteries. To the south, a large area of the region is occupied by the low branches of the Eastern Rhodopes and the slopes of Sakar Mountain. The Eastern Rhodopes are a unique territory, characterized by rich flora and fauna. The strong Mediterranean influence, the geological past of the mountain and the peculiarities of the local way of life and culture have helped to form and preserve various habitats.

1.2.2. WATER

Water resources are formed mainly from the outflow of the Maritsa River and its tributaries - Harmanliyska, Varbitsa and Byala. This water flow represents 5.8% of the country's river flow excluding the Danube River. Another source for the formation of the water resource potential is the groundwater, which represents 7.3% of the total volume for the country.

There are several mineral springs near the village of Mineralni Bani, the town of Merichleri, the village of Troyan, the municipality of Simeonovgrad and others.

1.2.3. CLIMATE

The climate in the region is extremely favorable, as it is influenced by the Mediterranean. It is especially pronounced in the southern part of the region and along the Arda River in Ivaylovgrad, Lyubimets, Madzharovo and others. It is characterized by mild winters and volatile snow cover, hot summers - often temperatures reach up to 40° C. Spring comes early - in early April, and autumn is longer and warmer. Droughts are often observed in summer.

1.2.4. ENVIRONMENT

In 2016, the share of the population of the region in settlements with public sewerage remains 72% (compared to 76% in the country). The share of the population with access to sewerage connected to wastewater treatment plants is 54% (compared to 63% in the country). Air pollution with carbon dioxide in the area is twice lower than the national average. In 2016, 127 tons of harmful emissions per square km were discharged into the atmosphere of the region compared to 281 tons of harmful emissions per square km in the country. There is a significant difference in the generated household waste. In 2016, 299 kg of domestic waste per person was generated in the region compared to 406 kg per person for the country.

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1.3. ECONOMIC DEVELOPMENT

1.3.1. INCOME AND LIVING CONDITIONS

The gross domestic product per capita in Haskovo region continues to grow in 2016, but the growth is relatively low and according to this indicator the region lags significantly behind the national average - BGN 7,276 per person compared to BGN 13,206 per person in the country. Along with the gross domestic product, wages and incomes in the region are also growing, but the increase is slower than the national average. The average annual gross salary of employees in Haskovo region reached BGN 7,964 in 2016, which leaves Haskovo among the five regions in the country with a salary of less than BGN 8,000. A relatively low share of the local population lives with material deprivation, but the share of the population living below the poverty line for the country remains higher than the average in 2017.

1.3.2. LABOR MARKET

After several years of stagnation, economic activity in the region decreased by nearly 2 percentage points up to 68% and remains below the growing activity in the country in 2017. The decrease was accompanied by a significant reduction in unemployment (to less than 5% compared to over 6% in the country) and keeping the employment level below the national average (64% compared to 67% in the country). The development of the labor market is limited by the deteriorating educational structure of the population. The share of university graduates among 25-64-year-olds is 17% (compared to 28% in the country), and those with primary and lower education - 20% (compared to 17% in the country).

1.3.3. INDUSTRY

The industry in Haskovo region is characterized by a well-developed industry structure and established market traditions. Large manufacturing companies are the main driving force of the local economy, while small and medium enterprises contribute to improving the business environment, accelerating economic growth and optimizing the production structure of the regional economy. The sector of small and medium enterprises in Haskovo region has the most reserves for opening alternative employment and new jobs, and in the future, its importance will continue to grow for the overall economic stability of the region. The following industries have dominant importance for the regional economy: chemical industry, wine production, food production, beverages and tobacco products, clothing and textile industry, construction and machine building for the food industry. Important factors for the development of the local economy are the skilled workforce, the availability of good natural resources, as well as the strategic location of the region, as a whole. The relative share of the exported industrial production in the region increases by 5 to 7% every year compared to the previous year. All the aforementioned factors predetermine over the years a moderate and stable rate of industrial growth of companies in the region.

An indicator of the good investment climate in the region are the foreign direct and domestic investments made. Haskovo Region occupies a strategic location and so is attracting potential

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investors. Foreign investments in the region is around the national average. The risk of dependence on a small number of large-scale investments in the region has led to a reduction in the volume of foreign direct investment in general. A positive fact is the number of large investments and new sites in industry and agriculture made in smaller municipalities. This shows that the whole region is an attraction for investors, unlike in many other areas of the country, where investment is mainly in larger cities.

Haskovo Region is establishing itself as one of the main centers in the country in terms of machine building for the food industry, preserving the traditions in the field of textile and clothing industry and formation of the region as one of the leading wine regions in the country.

In addition to wine production, the food industry in the region is represented by bakery and confectionery, meat processing industry, dairy and canning industry. There are many private companies, bakeries and confectionery shops, with relatively modern technological equipment, which produce a diverse range of products in the field of bakery and confectionery in Haskovo region. The same is the case with meat and dairy companies. In the region there are many small workshops for processing meat and meat products, dairies for cheese, yellow cheese and butter, equipped with modern facilities and producing products with high capacity and quality that meets modern international requirements. A large milk processing company - "Bulgarian Cheese" Ltd. Haskovo, operates On the territory of the region. It is equipped with brand new processing facilities, fully meeting the EU standards. In the town of Haskovo there is another large milk processing company - Bulmilk (the first certified milk processing company in the country with a quality management system certificate ISO 9001: 2000). The largest and well-known meat processing companies in the region are: "Lotos" Ltd. Dimitrovgrad, "Svarex" Ltd. Haskovo, "Burdenis 93" Ltd. Svilengrad, "Roni" Ltd. Harmanli and others.

Haskovo Region and in particular Haskovo Municipality are among the main centers of the Bulgarian machine building for the food industry. The specialization of the Haskovo town in the field of production of technological lines and machines for the food industry is preserved: /"Rodina - Haskovo" AD, "Trakia Commerce" AD, "Hranmash Engineering" EOOD, "Hydroplastform" OOD/, machines and installations for milk processing /"Donido Machine Industry" EAD/, heating and household appliances /"Erato Holding" AD/, technological lines for production of meat, dairy products and wine production /"PIM" Ltd./. Each of the above companies has established name and brand on the market and is a traditional participant and holder of awards from national and international exhibitions and fairs. The importance of this sub-sector in the regional economy is evidenced by the fact that an Association of Manufacturers of Machines for the Food Industry has been established in the town of Haskovo.

The chemical industry in the region is represented by one of the largest factories - producers of fertilizers in the country - "Neochim" JSC - Dimitrovgrad. The company is the only producer in Bulgaria of formalin, urea-formaldehyde resins, sodium nitrate, sodium nitrite, ammonium bicarbonate, liquefied sulfur dioxide, paradise gas, polyethylene oxide, glass-filled thermoplastics and others. The production of Neochim AD is well received on the international markets, as over 50% of the company's revenue is generated by exports. The chemical industry

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in the region is also the branch with the highest relative share in the general branch structure of the industrial production.

1.3.4. INVESTMENTS

Business and investment activities in Haskovo region remain relatively low. Expenditures for acquisition of tangible fixed assets per capita decreased in line with their decrease for the country, but in 2016 only in the Haskovo and Kardzhali regions they shrank to less than a thousand BGN per person (BGN 2,488 per person for the country). In 2016, for the second year in a row, there was an increase in foreign direct investment in the region, but their volume in the region remained among the lowest in the country - 516 euros per person compared to 3,310 euros per person in the country. There is also an increase in terms of absorbed European funds. As of June 30, 2018, the value of the amounts paid under the operational programs in the region reaches BGN 1,032 per person (compared to BGN 1,543 per person in the country). Within the region, the municipality of Svilengrad absorbs the most.

1.3.5. INFRASTRUCTURE

The density of the road and railway networks in the region is higher than the average in the other regions. The share of motorways and first-class roads is also higher, but the quality of the road surface remains lower than the national average. The share of road surface in good condition in the region reached 35% compared to 40% in the country in 2017. Internet access and use in the region remain close to the national average.

1.4. SOCIAL DEVELOPMENT

1.4.1. DEMOGRAPHIC CHARACTERISTICS

The aging of the population in Haskovo region follows the general trends in the country, although the demographic picture in the region is deteriorating at a faster pace. The natural growth rate decreased to -8.3 ‰ compared to -6.5 ‰ for the country in 2017. At the same time, there has been a slowdown in emigration from the region, which increased sharply in 2016. In 2017, there was a decrease in the age dependency ratio as a ratio of the population over 65 compared to 0-14 years, but it remains higher than the national average - 153% compared to 148% in the country. The share of the urban population in the region is close to the average, but the population density is significantly lower - 1,079 people per sq. km in urban areas compared to 1,537 people per sq. km in the country.

1.4.2. EDUCATION

The net rate of the population in grades V-VIII in the region remains lower than the national average in 2017. At the same time, there is a symbolic decrease in the share of second-year pupils and dropouts from primary and secondary education, but both indicators remain less favorable than secondary education. The graduates in their last year in school passed the exit

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exams in Bulgarian language and literature in 2018 with relatively poor marks. The average success of students in the region is 3.87 (compared to 4.24 for the country), and the share of poor grades is over 10% (compared to less than 6% for the country). The schools in the region succeeded to attract new teachers in 2017, but their relative number remains significantly lower than the national average. The number of students in the two universities affiliates in the region increased in 2017, despite the opposite trend in the country.

1.4.3. HEALTHCARE

In 2017, there was an even greater shortage of doctors in the region - both general practitioners and specialists. The bed base also remains among the more limited in the country. The number of beds in local general hospitals is 3.4 per one thousand people compared to 4.9 per one thousand people in the country. These factors are probably the explanation for the relatively low number of patients treated - 201 per one thousand people compared to 242 per one thousand people in the country.

1.4.4. CULTURE

Cultural life in the area is relatively low in 2017, although interest in local theaters, museums and libraries is increasing. Visits to theaters for the year increased to 258 per one thousand people (compared to 314 per one thousand people in the country), to museums - up to 209 per one thousand people (compared to 722 per one thousand people in the country), and to libraries - up to 325 per one thousand people (compared to 604 per one thousand people in the country). The number of visits to local cinemas has generally increased in recent years, although 2017 is a year of decline to 103 visits per one thousand people (compared to 778 per one thousand people in the country).

1.5. AGRICULTURE

1.5.1. PLANT GROWING

The Agriculture is one of the leading industries for Haskovo region, which boosts the employment for a large part of the population in the region. There are extremely favorable soil and climatic conditions for the development of crop production in the region. The temperate-Mediterranean climate, combined with the abundant water resources in the region, are important prerequisites for the cultivation of a wide variety of crops. The tobacco is a widespread technical crop in the area. It is grown mainly in the lower parts of the Eastern Rhodopes and the Sakar Mountain. Haskovo region is famous for the production of watermelons, melons, excellent grapes, tomatoes, cucumbers and many other fruits and vegetables. Priority in the development of crop production is the planting and replanting with young vineyards, increasing the area, perennials and the establishment of seed plots for certified species.

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Crop production, as a branch, produces a larger share of the total agricultural production in the region with production of cereals, technical and fodder crops predominantly. Vegetables, perennials - vines, fruit species, etc. are also grown.

Summarized for the municipalities in the region, it can be concluded that there is a certain territorial distribution of the different groups of agricultural crops. This is due to the climatic and soil features, as well as to the possibility of consolidation of agricultural land. Predominant crops in the plains and mountains of the region are quite different. In general, cereals are predominantly cultivated in the municipalities of Dimitrovgrad, Haskovo, Harmanli, Simeonovgrad. Leading in vegetable production and cultivation of perennials are the municipalities of Lyubimets, Svilengrad, Harmanli, Dimitrovgrad. The cultivation of oriental tobacco has traditions in the area, as it is mainly presented in the semi-mountainous parts of the municipalities - Stambolovo, Mineralni Bani, Ivaylovgrad, Topolovgrad, Svilengrad and Haskovo.

In general, based on the total arable agricultural area, Lyubimets municipality is a leader in the cultivation of the entire spectrum of agricultural crops. Dimitrovgrad Municipality is characterized by the most consolidated areas and the highest average yields per decare. The area is known for high yields of cherries, apples, plums, peaches, watermelons and melons - above the national average.

The positive fact is that the holdings with UAA over 150 decares is 4%. This is an indicator for consolidated intensive agriculture.

Haskovo Region has and is at a leading region in the country in terms of the area of agricultural land occupied by perennial crops and mostly vineyards. The cultivation of wine grape varieties is determined by the extremely favorable soil and climatic conditions - as evidenced by the high quality wine grapes harvested, serving as raw material in the wine industry. Wine production is really placed on an industrial basis, as the main part of the processing facilities are new, realized through projects under the Rural Development Program 2007-2013. Big share of labor is employed by the newly enlarged farms with processing facilities. To a large extent they are structurally determining for the economy of the municipalities of Lyubimets, Ivaylovgrad, Svilengrad, Harmanli, Stambolovo.

1.5.2. LIVESTOCK

The livestock breeding in the Haskovo region is extremely concentrated in the private sector and is characterized by a high relative share of small farms. Cattle, pigs and poultry are raised in the plains, and sheep and goats are raised in the semi-mountainous areas. The prospects for animal husbandry in the region are related to the consolidation of animal farms in order to increase productivity and to make optimal use of funding under international programs.

In Haskovo region the main types of farm animals are raised and they are almost 100% concentrated in the private sector. Cattle breeding is concentrated in the municipalities of Dimitrovgrad, Haskovo and Harmanli, where there is a fodder resource of cereals and irrigated areas with suitable conditions for growing alfalfa and fodder corn. In the semi-mountainous and mountainous parts of the municipalities of Svilengrad, Topolovgrad, Ivaylovgrad, Madzharovo,

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Stambolovo and Mineralni Bani sheep and goat breeding predominates. The municipalities of Ivaylovgrad, Madzharovo and Topolovgrad are characterized by the breeding of rare and endangered breeds of cattle and sheep. Poultry farming is concentrated in large poultry farms in the municipalities of Haskovo and Dimitrovgrad. There are also buffalo farms in the municipalities of Harmanli and Haskovo. Beekeeping is developed on the territory of the whole region.

1.6. CONCLUSIONS:

	Weak	Unsatisfactory	Average	Good	Very good
Economical development	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Income and living conditions	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Labor market	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Investments	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Infrastructure	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				

Figure 1. Assessment of the economic development of the four cross-border regions

Blagoevgrad region has the best indicators for economic development compared to the other three cross-border regions. The economic development of the region is assessed as “good”. Smolyan region is at second place in terms of economic development, rated as “average”, followed by Haskovo region with an “unsatisfactory” score. The region of Kardzhali has the worst economic indicators of the four cross-border regions. Economic development is

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represented by the indicators: Income and living conditions, Labor market, Investments and Infrastructure.

According to the first indicator - income and living conditions, Smolyan region is assessed as “good” and ranks first of the four regions. The second place is shared by the regions of Haskovo and Blagoevgrad, and Kardzhali holds the last place with “weak” assessment.

Blagoevgrad region ranks at first place for the labor market indicator. The second place is shared by the regions of Haskovo and Smolyan, and the region of Kardzhali again has a “weak” assessment and occupies the last place.

The level of investments in Blagoevgrad region is “average”, however, it ranks first in the listed regions. The Smolyan region is at second place and the last place is shared by the regions with “weak” assessment - Haskovo and Kardzhali, in which the share of investments is the smallest.

From the point of view of the infrastructure indicator, Haskovo region ranks first, as the infrastructure is assessed as “good”. The regions of Kardzhali, Blagoevgrad and Smolyan, are respectively at second, third and fourth place. The worst level of infrastructure is in Smolyan region, which is partly due to the geographical location of the region, i.e. in a mountainous region.

	Weak	Unsatisfactory	Average	Good	Very good
Social development	Blagoevgrad				
	Kardjali				
	Haskovo				
	Смолян				
Demographics	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Education	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Healthcare	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				
Culture	Blagoevgrad				
	Kardjali				
	Haskovo				
	Smolyan				

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Figure 2. Assessment of the social development of the of the four cross-border regions

The social development of the regions is represented by the following indicators: Demography, Education, Health and Culture. Despite the weak economic development of Smolyan region, from the point of view of social development the region is with the highest rating “very good condition”. The regions of Blagoevgrad and Kardzhali are rated with “good condition”, and the region of Haskovo is in last place with an “average condition” of social development.

In terms of demography, Kardzhali region has a “very good” score, followed by Blagoevgrad and Haskovo. The Smolyan region has the worst demographic indicators, whose condition is assessed as “unsatisfactory”. However, the state of education and healthcare in Smolyan is “very good”.

Blagoevgrad region has “good” assessment of the educational situation, Kardzhali – “unsatisfactory” assessment and Haskovo a “weak” assessment.

The level of health care is “average” in the regions of Blagoevgrad and Kardzhali, and “unsatisfactory” in Haskovo.

The values of the culture indicator are the worst of all the indicators for social development. The assessment of Blagoevgrad and Haskovo is “unsatisfactory”, and the assessment of Smolyan and Kardzhali is “weak”.

TASK 2 ANALYSIS OF THE CURRENT TRENDS IN YOUTH EMPLOYMENT AND ENTREPRENEURSHIP IN THE AGRICULTURAL SECTOR OF THE FOUR REGIONS BORDERING THE HELLENIC REPUBLIC: HASKOVO, KARDZHALI, SMOLYAN AND BLAGOEVGRAD.

2.1. STRUCTURE OF THE AGRICULTURAL HOLDINGS

2.1.1. BLAGOEVGRAD REGION

Blagoevgrad region is located in the Southwest region and is one of the 28 regions of Bulgaria (NUTS level 3 of the General Classification of Territorial Units for EU Statistical Purposes). The total area of the region is 6 649.5 sq. Km., Which represents 5.8% of the country's territory. The number of settlements is 278 - 13 cities and 265 villages, administered in 14 municipalities. The population of the region, according to the 2011 census, is 323,552 people or 4.4% of the country's population. The total amount of used agricultural area (UAA) in the region is 583 588.5 decares and occupies 9% of its territory.

The number of agricultural holdings in Blagoevgrad Region is 38,467, which represents 10.4% of the holdings in the country - the largest number of holdings in Bulgaria. The average size of UAA in the region is 15.4 decares, this is the region with the smallest farms - 15% of the average size for the country (101.3 decares). Of all farms, 553 do not have UAA. The largest is the number of agricultural holdings with UAA in the municipality of Petrich - 7,141 with an average area of 9.8

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decares, they cultivate 12% of the UAA of the region. In the Municipality of Sandanski the farms cultivate the largest share of UAA - 14% or 79 838 decares. The farms that cultivate over 500 decares are 112. and cover 47% of the total UAA of the region. The agricultural holdings, which cultivate up to 10 decares, are 31,914. or 84% of UAA farms in the region, cultivating 20% (116,093 decares) of UAA.

Work force

In 2010, 73,985 people (excluding seasonal workers) worked on agricultural holdings, and the volume of labor input was 35,052 annual work units (AWU). 73,061 people or 99% of those employed in agriculture in the region participate as family labor. The non-family labor force (employees) is 924 and they form 1% of the employed, having worked a total of 817 AWU. Seasonal workers have worked 47,038 man-days, which is 203 AWU. Women are 46% of the employed and men - 54%. Retirees over the age of 64 who work in agricultural holdings are 27% of the employed, and those working under the age of 34 are 11%. Of the 38,467 farm managers (including individuals), 74% are men and 26% are women. The managers have worked a total of 19,621 AWU. Up to 34 years of age are 8% of them, and over 64 years are 33%.

2.1.2. SMOLYAN REGION

Smolyan region is located in the South Central region and is one of the 28 regions of Bulgaria (NUTS level 3 of the General Classification of Territorial Units for statistical purposes of the EU). The total area of the region is 3 193 sq. km., Which represents 2.9% of the country's territory. The number of settlements is 242, administered in 10 municipalities, as the cities are 8, the villages - 234. The population of the region, according to the census in 2011, is 121 752 people or 1.7% of the population. The average population density is 38 inhabitants / sq. Km. at an average density for the country of 66 g / sq.km. The total amount of the used agricultural area (UAA) is 199 787.8 decares and occupies 6% of the territory of the region.

The number of agricultural holdings in Smolyan region is 16,348, which represents 15% of the holdings in the South Central region and 4% of the holdings in the whole country. The utilized agricultural area (UAA) is 199,787.8 decares and is distributed in 16,236 farms. The average UAA for a farm in the region is 12.3 decares compared to the national average of 101.3 decares and according to this indicator the region is one of the last places in the country. The farms that do not have UAA are 112. The agricultural holdings in the Municipality of Chepelare are the largest - their average UAA is 23 decares, and the smallest are the farms in the Municipality of Rudozem - their average UAA is 6 decares. The largest number of agricultural holdings is in the Municipality of Smolyan - 18% of the holdings in the region, followed by Nedelino and Dospat, respectively 14% and 12% of the holdings. There are 19 farms that cultivate over 500 decares of UAA. and cover 9% (16,985 decares) of the UAA of the region. The agricultural holdings, which cultivate up to 10 decares, are 10,648. or 66% of the UAA farms in the region and cultivate 24% (48,561 decares) of the UAA.

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Work force

In 2010, 31,254 people (excluding seasonal workers) worked on agricultural holdings, and the volume of their labor input was 12,136 annual work units (AWU). 30,870 people or 99% of those employed in agriculture in the region participate as family labor. The non-family labor force (employees) is 384, which form 1% of the employed and have worked a total of 277 AWU. Seasonal workers have worked 42,000 man-days, which is 181 AWU. Women are 48% of the employed and men - 52%. Pensioners over the age of 64 who work on agricultural holdings are 24% of the employed, and those working under the age of 34 are 8%. Of the 16,348 farm managers (including individuals), 74% are men and 26% are women. The managers have worked a total of 6,601 AWU. Up to 34 years of age are 5% of them, and over 64 years are 30%.

2.1.3. HASKOVO REGION

The number of agricultural holdings in Haskovo region is 18,420, which represents 4% of the holdings in the country. The utilized agricultural area (UAA) is 1,397,133.7 decares and is distributed in 17,431 farms. The average UAA of the farms in the region is 80.2 decares or 79% of the average size for the country - 101.3 decares. The number of farms that do not have UAA is 989. The largest share of UAA is Dimitrovgrad municipality - about 22% of the total UAA, followed by Haskovo municipality with 20%, Svilengrad with 15% and Harmanli with 13%. The municipalities of Madjarovo and Mineralni Bani have the smallest UAA, respectively with 1% and 2% of the total UAA. Haskovo municipality has the largest number of agricultural holdings - 3 633, which represents 20% of all farms in the region. Next is the municipality of Svilengrad - 2,434 farms or 13% of the total number of farms. The smallest number of farms is in the municipalities of Simeonovgrad - 326 and Madjarovo - 396 farms. There are 411 farms that cultivate over 500 decares of UAA. (2%) and cover 78% (1,095,565 decares) of the total UAA of the region. The agricultural holdings, which cultivate up to 10 decares, are 11 772. or 68% of the UAA farms in the region, but cultivate only 3% (39,342 decares) of the UAA.

Work force

In 2010, agricultural holdings employed 40,612 people (excluding seasonal workers), and the volume of labor input was 22,181 annual work units (AWU). 37,380 people or 92% of those employed in agriculture in the region participate as family labor. The non-family labor force (employees) is 3,232, which form 8% of the employed and have worked a total of 2,879 AWU. Seasonal workers worked 538.6 thousand man-days, which is 2,321 AWU. Women are 44% of the employed and men - 56%. Retirees over the age of 64 working in agricultural holdings are 27% of the employed, and those working under the age of 34 are 12%. Of the 18,420 farm managers (including individuals), 75% are men and 25% are women. The managers have worked a total of 10,623 AWU. Up to 34 years of age are 9% of them, and over 64 years are 34%.

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2.1.4. KARDZHALI REGION

Kardzhali region is located in the South Central Region and is one of the 28 regions of Bulgaria (NUTS level 3 of the General Classification of Territorial Units for EU Statistical Purposes). The total area of the region is 3,209 sq. km., which represents 2.9% of the country's territory. The number of settlements is 470, administered in 7 municipalities, with 5 cities and 465 villages. The population of the region, according to the 2011 census, is 152,808 people or 2.1% of the country's population. The total amount of used agricultural area (UAA) is 256,558.6 decares and occupies 8% of the country's territory.

The number of agricultural holdings in Kardzhali region is 22,833, which represents 20.9% of the holdings in the South Central region and 6.2% of the holdings in the whole country. The used agricultural area in the amount of 256,559 decares is managed by 22,502 farms. The average size of UAA is 11.4 decares for the region or 11% of the average size for the country - 101.3 decares. The number of farms that do not have UAA is 331. Farms are one of the smallest in the country. The largest share of UAA is in the municipality of Kardzhali - 22% or 56,743 decares. The largest number of farms is in the municipality of Kirkovo - 24% of all in the region or 5,448. The share of UAA is the smallest in the municipality of Jebel - 7% or 18,448 decares, distributed on 1,690 farms. The farms that cultivate over 500 decares of UAA are 22. and cover 8% (21,255 decares) of the UAA of the region. Agricultural holdings, which cultivate up to 10 decares, are 15 213 pcs. or 68% of the UAA farms in the region, but cultivate 27% (68,622 decares) of the UAA.

Work force

In 2010, 42 881 people (excluding seasonal workers) worked on agricultural holdings, and the volume of their labor input was 32,124 annual work units (AWU). 42,636 people or 99% of those employed in agriculture in the region participate as family labor. There are 245 non-family labor force (employees), which form 1% of the employed and have worked a total of 234 AWU. Seasonal workers have worked 20,000 man-days, which is 86 AWU. Women are 48% of the employed and men - 52%. Retirees over the age of 64 who work on agricultural holdings are 21% of the employed, and those working under the age of 34 are 16%. Of the 22,833 farm managers (including natural persons), 66% are men and 34% are women. The managers have worked a total of 17,924 AWU. 12% of them are under 34 years old, and 25% are over 64 years old.

2.2. TRENDS AND PROBLEMS IN THE AGRICULTURAL SECTOR IN BULGARIA

According to data from the World Bank, the number of employed workers in agriculture is constantly decreasing - from 43% in 1991. at 26% in 2017 This trend is due to the transition from industrial and post-industrial society to information, where the main production resource is high technology and knowledge. In Bulgaria, the number of employees in the agricultural sector in 2017 has decreased slightly more than twice compared to 2007 data. - from 490 thousand to 210 thousand people, so the number of people employed in agriculture is 6% of all workers in the country.

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According to a report by the Agricultural Academy from 2020 there are several main problems of the agricultural sector in Bulgaria.

First of all, the demographic crisis in Bulgaria is pointed out, which most strongly affects villages and small towns. Young people leave their native places to look for higher-paying jobs, and thus small settlements are composed mainly of an aging population, leading to permanent depopulation of villages. According to Eurostat data in 2016 there is a decrease in the number of people employed in agriculture in the highest age group (over 65) - from 45% in 2007. at 36.4%. However, it remains high for European average levels - 32.8%. At the same time, for the same period, the employment of young people in the sector (under 39) doubled - from 7.8% in 2007. at 14% in 2016 thus the levels in Bulgaria are higher than the average for the European Union, where the percentage of this group decreases by almost 4%.



Figure 3 Relative share of the employed in agriculture by age groups in Bulgaria and on average for the EU-27 countries in the period 2007-2016. (%)

Source: Institute of Agricultural Economics, 2020 according to Eurostat

Secondly, the nature of work, low pay and poor working conditions are emerging as problems. The delayed modernization of the sector - technical, technological, automated, etc. type of modernization, makes the working conditions in agriculture unacceptable and leads to the refusal of the younger generations to seek realization in this field. Several factors can be cited as reasons for the delayed modernization:

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- Financial, which is expressed in the lack of capital to invest in order to improve the inventory and technology on farms.
- Another factor is the large number of small farms, which on the one hand does not allow the use of machinery due to small areas and on the other hand does not allow farm owners to generate capital to be invested back - the most common problem is high production costs and the low purchase price.
- The third factor is the low qualification of the staff employed in the agricultural sector, despite the noticeable gradual increase in the share of those who acquired qualification in the period 2007. - 2016 The most significant is the increase in those who have acquired level 3-4 (defined as average) - from 14% to 25.3%, and there is a slight increase in graduates - from 1.1% to 2.4% - in the EU their percentage has doubled - from 3.6% to 6.6%. The lack of highly qualified staff does not allow the technological development of farms.

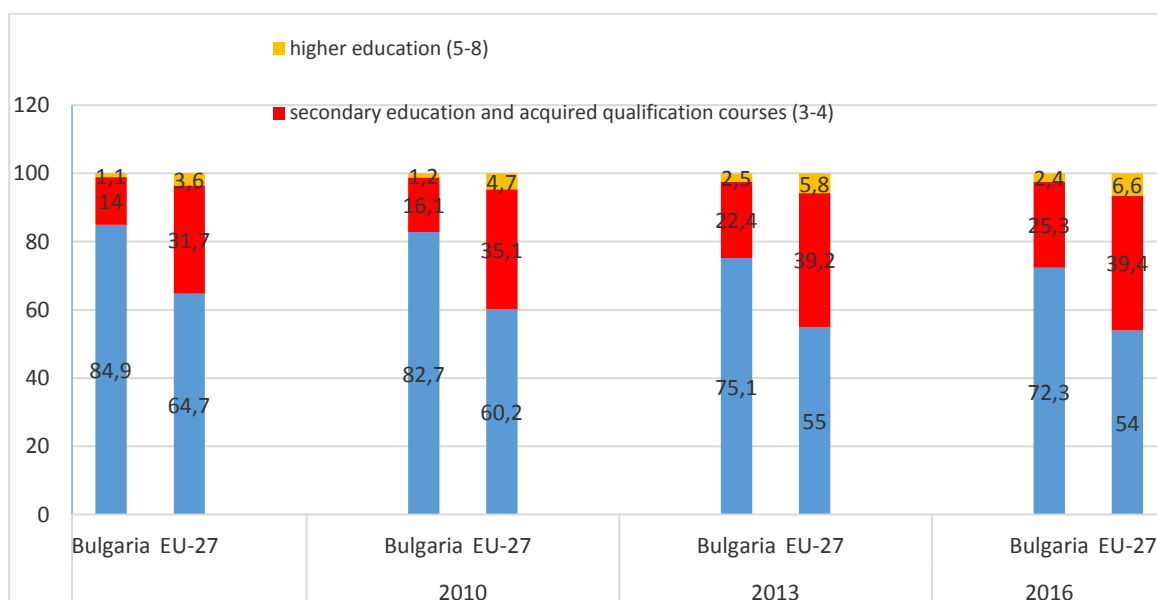


Figure 4. Change in the qualification and educational structure in sector "Agriculture, fisheries and forestry" in Bulgaria and for the EU-27 average in the period 2007-2016.

Source: Institute of Agricultural Economics, 2020 according to Eurostat data

Depopulation of villages and small towns, low wages and poor working conditions also lead to a low degree of continuity of agricultural labor between generations. This speaks of the need for financial measures in the agricultural policy to promote intergenerational continuity in the industry.

According to NSI data in the period 2007-2017, there is an increase in the total volume of investments for acquisition of tangible fixed assets in agriculture, forestry and fishing - from 2.3% to 8.2%. This is due to the launch of European programs aimed at the development of agriculture in Bulgaria, which, however, small farms cannot benefit from investment measures

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because they do not have sufficient resources. The integration of Bulgarian agricultural producers on the European market requires compliance with modern European practices, standards for production of high quality, safe for consumers and competitive products.

In the field of crop production, the largest production is of wheat, oats, corn and oilseed sunflower. The Fruit and Vegetables sector suffers the most, as well as the Fruit and Vegetable sector, as labor shortages are most pronounced there due to the nature of the work. The largest deficit in the agricultural sector is in animal husbandry, with Bulgaria lagging behind the European average.

2.3. FORMS OF EMPLOYMENT IN AGRICULTURE

Agricultural employment depends on natural factors - climate, soil, seasons, as well as on the specifics of labor, mechanization and automation of the work process, involvement in both public and private production.

The forms of employment in agriculture are determined by the variety of types of land ownership, as well as by the methods of production. Blagoevgrad region has the smallest farms in the country.

The size of the holdings determines the share and the form of employment. The labor force in small farms consists mainly of the farmer and his family and a small number of employees. Employment in the agricultural sector of employed workers depends on the type of agriculture (livestock or crop production). Workers in the greenhouse production and those growing more than one crop are constantly employed.

2.3.1. SCOPE OF YOUNG PEOPLE IN THE GENERAL STRUCTURE OF THE WORKING POPULATION IN THE COUNTRY AND COMPARISON OF YOUTH EMPLOYMENT (UNEMPLOYMENT) COMPARED TO THE NATIONAL AVERAGE.

The dynamics in the range of young people in relation to the total working population in the country can be traced in Figure 5.

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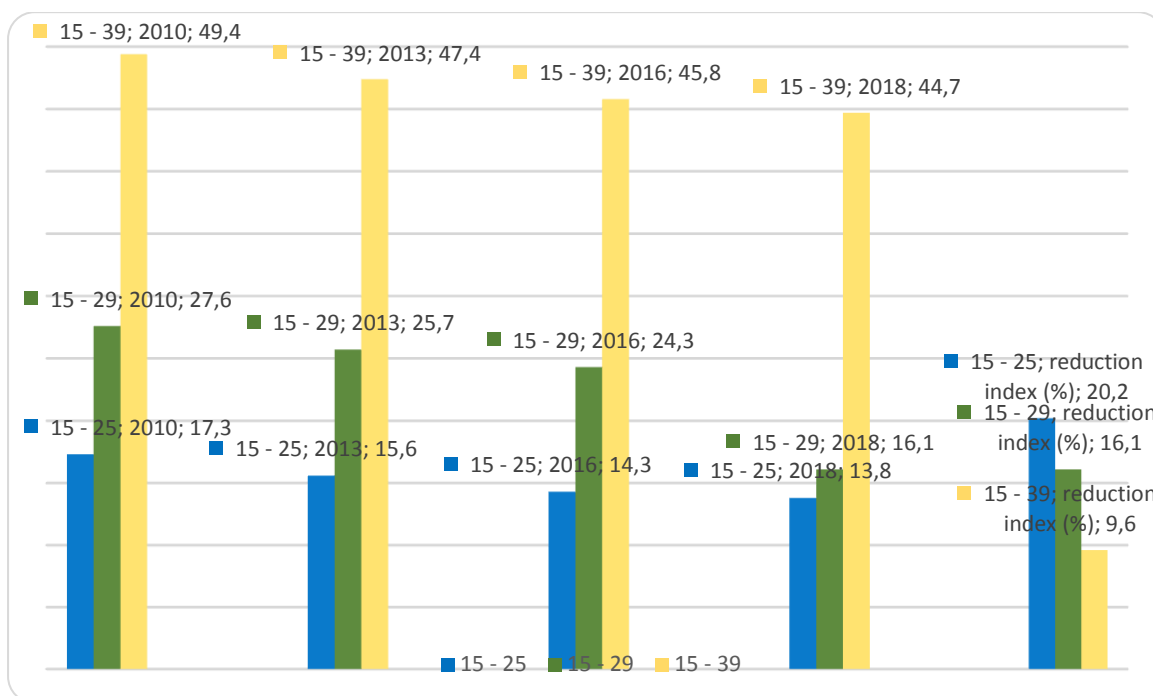


Figure 5 Relative share of young people in the total working population of the country (%)

Source: NSI data

The analysis of the above chart shows a decrease in all youth age groups in 2018 compared to 2010. Despite the general downward trend in the relative share, the rates of this decrease are not the same in the three age groups of young people. The differences are significant, which is more strictly proved by the coefficient of variation ($K_v = 35\%$). The share of the youngest persons under 25 decreased the fastest (by 1/5), and the least in the group of persons under 39 (by almost 10%).

Data on youth employment (15-25 years) and (15-29 years) are presented in Table 1 and Table 2, respectively.

During the period 2010-2018 the youth employment of persons under 25 decreased by 6.8% while the total employment for the same period increased by 12.2%. As a result of the noted divergent trends, the scope of youth employment under 25 decreased from 47.5% in 2010 to 39.5% in 2018 (or by almost 17%).

Table 1 Total employment rate, incl. the youth (from 15 to 25 years old) in 2010-2018. (%)

Year	Total employment	Youht employment	Scope of youth employment
			under 25
2010	46.7	22.2	47.5
2013	46.9	21.2	45.2
2016	49.3	19.8	40.2

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2018	52.4	20.7	39.5
index of change 2018/2010 (%)	12.2	-6.8	-16.9

Source: NSI data

Table 2 Total employment rate, incl. the youth (from 15 to 29 years) in 2010-2018. (%)

Year	Total employment	Youth employment	Scope of youth employment under 29
2010	46.7	35.6	76.2
2013	46.9	36.7	78.3
2016	49.3	38.3	77.7
2018	52.4	40.8	77.9
index of change 2018/2010 (%)	12.2	14.6	2.1

Source: NSI data

In contrast to the trends in the change of youth employment up to 25 years, in the older age group (up to 29 years) there is an increase in employment by 14.6%, which is even higher than the increase in total employment (12.2%). This is the reason for the increase in the scope of youth employment up to the age of 29 in total employment, although insignificant by 2.1% in 2018 compared to 2010.

2.3.2. TRENDS IN THE YOUTH WORKFORCE IN DIFFERENT SECTORS.

In the period 2007-2016 there are trends in the change of the labor force, which is characterized by variations in different sectors of agriculture - field crops, vegetable production, perennial crops and vineyards, grazing animals, pigs, poultry and rabbits, mixed crop, mixed livestock and mixed crop-livestock farms. According to Eurostat data, there is an increased interest on the part of the youngest age group (up to 39 years) in the crop sector. There is an increased interest in perennials and vineyards, where the increase in 2016 is 122.3%, according to the Ministry of Agriculture and Food. In 2016 the number of young farmers growing perennials has almost doubled compared to 2011. After fruit and vineyards, the most preferred branches of crop production are mixed crop production with 62%, vegetable production with 40.6% and field crops with 30.4%. The growth in the number of young farms in arable crops is explained by the

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transfer of ownership of the farm to young heirs, thus providing access to subsidies under the Young Farmers Support Scheme and RDP measures for young farmers.

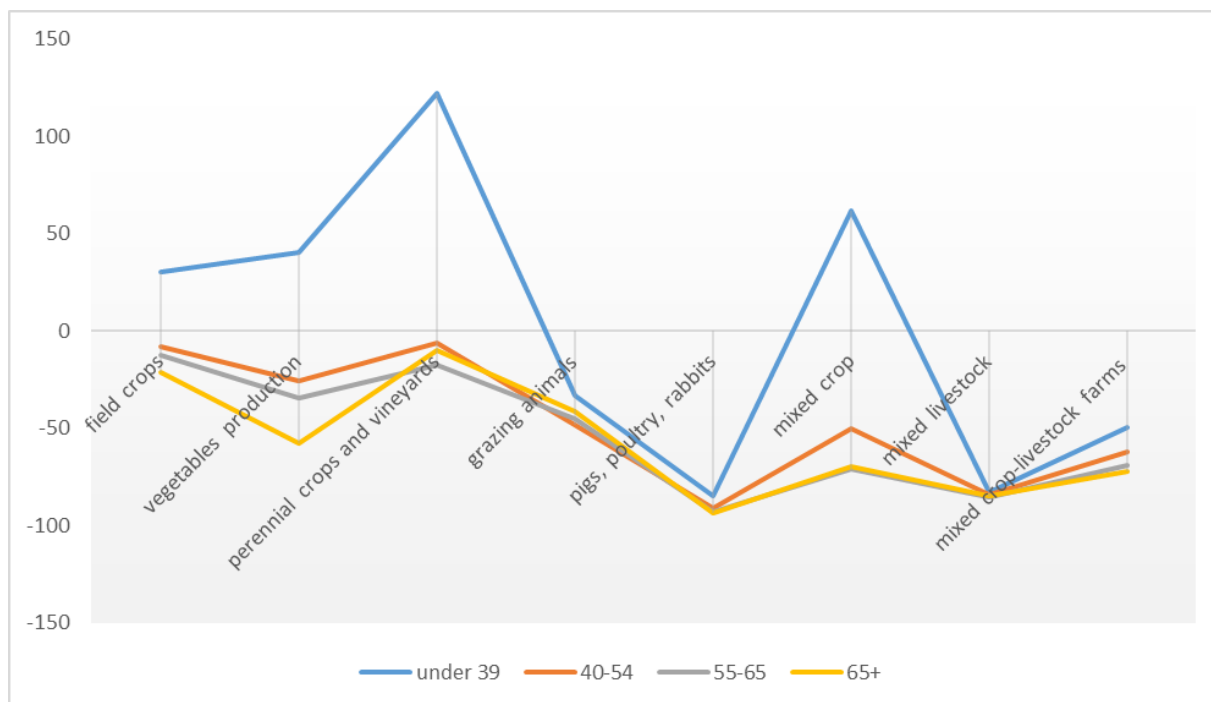


Figure 6 Index of change in the absolute number of agricultural holdings by age groups and sectors in 2016 compared to 2007 (%)

Source: Institute of Agrarian Economics, 2020 according to Eurostat data

2.3.3. DISTRIBUTION OF THE YOUTH WORKFORCE IN THE SOUTH CENTRAL AND SOUTHWEST REGIONS

Despite the increased number of young farmers in the country, their absolute number in 2016 is still insufficient to notice a radical change. The main motives for continuing the trend of increasing interest in the field of agriculture are the policies for supporting young farmers, as well as the investment measures set in the RDP.

According to data from the Ministry of Agriculture and Food from 2016, the number of persons employed in agricultural holdings (non-family and family labor force) in the South Central Statistical Region³, is the biggest – 140 117, followed by the Southwest region⁴with 87 227, out

³ The following regions are included in the South Central Region - Kardzhali, Haskovo, Smolyan, Plovdiv and Pazardzhik.

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of the total for the whole country – 439 736. These values can be explained by the more favorable climate in the southern regions, as well as by the larger number of farms there (in Blagoevgrad region there are the most small farms for the whole country).

In the South Central region the number of managers of agricultural holdings under the age of 39 is 7 574 people out of a total of 77 690 hours, and among the young people the most numerous is the group of owners between 35 yo and 39 yo – 4 177 the most common. The number of managers over the age of 55 is significantly higher (a little over five times) – 39 008.

In the South-West region, the managers of agricultural holdings under the age of 39 are only 5 427 out of a total of 110 189 and here there is no significant difference between the age groups of 25-34 and 35-39 (2 419 and 2 606, respectively). Here the difference between the group of young people and those over 55 (27 079) is also nearly 5 times. The data clearly show the small number of young farm managers.

Table 3 Distribution of labor input by managers according to their gender, age and importance of their work on the farm by statistical regions

⁴ Southwestern region consists of the regions of Blagoevgrad, Kyustendil, Pernik, Sofia region and Sofia city.

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Statistical regions	Managers									
	Total	of which								
		men	women	Age groups (years)						
				≤24	25 - 34	35 - 39	40 - 44	45 - 54	55 - 64	≥ 65
BULGARIA	201,014	151,031	49,983	2,038	12,623	13,438	12,578	38,894	48,318	73,125
North-West	22,205	16,996	5,209	332	1,519	1,167	1,400	3,551	4,757	9,479
North Central	22,855	18,038	4,817	259	1,688	1,845	1,076	5,164	4,737	8,087
North-East	22,421	17,768	4,653	367	1,462	1,400	1,910	4,814	5,505	6,963
South-East	27,859	20,539	7,320	359	2,457	2,243	1,988	4,984	6,355	9,474
South-West	42,134	31,040	11,095	402	2,419	2,606	2,076	7,552	9,802	17,277
South Central	63,539	46,650	16,889	319	3,078	4,177	4,128	12,829	17,163	21,845

Source: MAF, Agrostistics Department, GDZRP, Structure of agricultural holdings

In contrast to the positive changes in the crop sector in Bulgaria, the levels of the labor force of the youngest age group in animal husbandry are decreasing. This is most clearly seen in the breeding of pigs, poultry and rabbits, where the number of young people decreased by 84.6%, in mixed livestock - by 83.1% and in mixed crop and livestock farms - by 49.7%. Support schemes in this sector have not had a positive impact on the rejuvenation of the workforce, which may be due to the specifics of animal husbandry.

According to Eurostat data, there are changes in the age structure of agricultural holdings in the period 2007-2016. The number of young farmers up to 39 yo has increased in all crop sectors and at the same time the absolute number of representatives of the highest age group - that over 65 years, has decreased. Despite the outflow from the livestock sector, there are positive changes in the number of employed young people in the breeding of herbivores - from 9.4% to 11.1%, in mixed crop and livestock - from 5.5% to 8.7%. The share of young people in pig, poultry and rabbit breeding has doubled - from 5.2% to 10.7%. The most noticeable change is in the mixed crop farms - from 6.7% to 25.3%. The increased share of young farmers in the period 2007-2016 is due to a decrease in the number of representatives of the group over 65 years: "During the period 2007-2016 there are more noticeable age changes in the sectors where, on the one hand, the rate of decline in the high and middle age groups is significant and, on the

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other hand, these sectors represent a certain entrepreneurial interest for young people. ⁵. The most significant are the changes in the mixed crop sector and vegetable production.

The number of persons employed on agricultural holdings in the South-Central region is under the age of 34, is 11,481 and is almost equal to the number of employees between the ages of 35. and 39 years, while in the South-West region the data indicate that the number of the first group is 7286, and the second is more than twice as large - 20 309. The cited results show that the number of young people employed on farms is insignificant, especially given the large number of employees over the age of 55 - 76,483 in the South Central and 49,948 in the Southwest.

Table 4 Distribution of persons employed in agricultural holdings by age in all statistical regions in Bulgaria

Statistical regions	Persons working on the holding							
	Sex		Age groups (years)					
	men	women	<= 24	25 - 34	35 - 44	45 - 54	55 - 64	>= 65
BULGARIA	264,393	175,343	7,050	33,473	67,157	100,989	108,012	123,054
North-West	30,183	17,318	827	3,547	7,013	10,275	10,396	15,443
North Central	35,016	19,165	1,080	4,958	8,765	14,653	11,551	13,174
North-East	31,983	17,313	975	3,697	9,002	12,434	11,928	11,262
South-East	38,313	23,101	1,000	5,672	10,363	13,496	15,074	15,809
South-West	49,758	37,469	1,100	6,186	11,705	18,289	20,551	29,397
South Central	79,140	60,977	2,068	9,413	20,309	31,843	38,513	37,970

Source: MAF, Agrostatics Department, GDZRP, Structure of agricultural holdings

Eurostat data on the dynamics of the age structure of farmers by main crop groups⁶ show significantly greater interest on the part of young people in fruit growing - from 10.6% in 2007. to 32% in 2016, and also in Polish vegetable production - from 7.4% to 27%. Despite the increase in employment in Polish vegetable production, the report of the Institute of Agrarian Economics indicates a decrease in the number of young producers of potatoes, watermelons and melons in 2016. compared to 2011 citing data from the Ministry of Agriculture and Food.

⁵ Report of the Institute of Agrarian Economics - Sofia, p.371

⁶Main groups of crops - cereals, oilseeds and protein crops; greenhouse vegetable production; Polish vegetable production; vines; fruits.

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The small change in greenhouse production can be explained both by the high costs needed to sell products and by insufficient subsidies to cover the needs of young farmers.

There is a growing interest among the youngest age group in essential oil and medicinal crops (oil rose, lavender, mint, lemon balm), where the number of employees has almost doubled in 2016. Existing financial support for the cultivation of medicinal plants restricts small farm owners, which is an obstacle for novice farmers.

Another increased interest is observed in beekeeping, where the share of young farmers has increased by 91.2%. This can be explained by the current support schemes - National Beekeeping Program 2014-2016 and 2017-2019.

In the period 2007-2016 an increase in the share of employed young people is observed in the breeding of sheep, goats and other herbivores - from 7.6% to 11.3%. In the period under review there is an increase in the percentage increase of employed young farmers in 2010. in dairy cattle breeding, beef cattle breeding, in combined dairy and meat production, as well as in sheep, goats and other herbivores, which, however, decrease in the following years. However, these are relative changes that do not change the absolute number, because when we look at the data on the number of farmers by main species, there is a decrease in their number, which is most noticeable in dairy cattle breeding (from 5 650 in 2007 to 2 720 in 2016) and in the combined milk production (from 1 555 to 350).

2.4. CONCLUSIONS:

1. In the period 2007-2016 slight changes in the absolute number of young people in agriculture are observed.
2. There is an improvement in the age structure in the agricultural sector.
3. There is a significant increase in the number of young farmers growing fruit - in 2016. are 3630 pieces, while in 2007 are only 890, which is due to incentives for the creation of perennials (walnuts, almonds, stone and seed fruits).
4. There is a big increase in the number of young farmers growing cereals, oilseeds and protein crops - a jump of 115%.
5. Increased interest in growing vegetables outdoors.
6. There is a decline in the absolute number of young farmers in the livestock sector.
7. In animal husbandry, there is an increase only in cattle breeding and small cattle, which is a consequence of the support measures.
8. Dairy farming and combined dairy with meat production are declining.
9. There is no difference between the number of newly attracted young farmers and those who left the sector in the period 2007-2016.

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10. The leading motive for the entry of young people in the agricultural sector is the incentive under M.112, Measure 6.1 and the Scheme for young farmers.
11. Despite the existing financial incentives, there is a need to provide more for young farmers who have already entered the sector.
12. The main reasons for the lack of motivation among young people in agriculture are low incomes, lack of skilled labor, lack of funds to invest in the modernization of farms, difficult access to finance, the inability to rent or buy land, according to experts, discourage motivation for exercising agricultural activity.
13. Access to agricultural land is becoming a problem for young farmers - increasing the price and rent of agricultural land; the existence of large farms, which restricts access to such by young farmers.
14. Young farmers have benefited from existing measures in this period to promote the employment of young farmers in the agricultural sector.
15. The interest is focused on plant growing.
16. Livestock breeding suffers from a lack of financial mechanisms to support their existence and development. There are such only for beekeeping.
17. The financial resources allocated under the Ministry of Foreign Affairs are not sufficient for starting an agricultural business.
18. Young farmers do not have enough equity.
19. There are no preferential conditions for young farmers when taking out loans.
20. There is a high interest rate on loans; insufficient collateral; uncertainty in lending and income from their own production.
21. Lack of financial resources to apply for measures in the PRSP for financial support.
22. Among young farmers there is a higher activity in the introduction of innovations in agriculture.

TASK 3. STUDY OF THE ENVIRONMENTAL CONDITIONS IN THE BORDER AREAS AND ASSESSMENT OF THE POTENTIAL THREATS AND CHALLENGES FOR THE AGRICULTURAL SECTOR

3.1. GREENHOUSE GAS EMISSIONS IN THE AGRICULTURE SECTOR

According to data from the Executive Environment Agency (EEA) in Bulgaria annually are

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prepared National Inventory reports of greenhouse gas emissions⁷.

The reports are prepared in connection with Bulgaria 's commitments to the signing of [United Nations Framework Convention on Climate Change](#)(UNFCCC) and include an inventory of greenhouse gas emissions for the country by sources and sinks according to the methodology approved by the UNFCCC. The United Nations Framework Convention on Climate Change is the first and foremost international legal instrument addressing climate change at the global level. The main objective of the Convention is "To stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference within the climate system". In 1995, Bulgaria ratified the UN Framework Convention on Climate Change. The inventories cover emissions of direct greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O); greenhouse gas precursors (NO_x, CO and NMVOCs) and sulfur dioxide (SO₂). Emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and Sulphur hexafluoride (SF₆) are subject of studies in Bulgaria since 1995.

Greenhouse gas (GHG) emissions from the agricultural sector are the result of activities and processes of production and processing of agricultural products, soil fertilization, treatment and storage of animal waste.

The main sources of CH₄ and N₂O gasses are the processes and activities of the above mentioned sub categories. The greenhouse gas emissions from sector Agriculture are divided into following sub categories:

- domestic livestock activities with enteric fermentation;
- treatment of waste from farm animals;
- rice cultivation, CH₄;
- N₂O emissions from agricultural soils (fertilization);
- Agricultural residue burning.

When burning agricultural residue from stubble, certain amounts of GHG precursors are also emitted. Although the burning of stubble is prohibited in Bulgaria, the practice shows that not only stubble is burned, but also areas with plantations that have no economic significance for the owners. Therefore, this source of GHG emissions is also estimated in the inventory.

Agriculture emits a total of 38,282 t of ammonia, with cattle being the largest source (dairy cows and buffaloes). In 2009, agriculture emitted 35,374 t of non-methane volatile organic compounds. The biggest source is the annual plantations with fertilization. Agriculture is also a source of greenhouse gases. The main greenhouse gases emitted by agricultural activities are methane and nitrous oxide.

In 2018, the agricultural sector contributes 11.10% to the total greenhouse gas emissions in

⁷<http://eea.government.bg/bg/dokladi/unfccc> -National Inventory reports of greenhouse gas emissions

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Bulgaria (excluding NMVOCs). In 2009, the emissions from the Agriculture sector represent 10.5% of the total greenhouse gas emissions of Bulgaria. The analysis of the data shows a decrease in total emissions from agriculture by 67.4% compared to the base year of 1988. Since 2004, there has been a steady downward trend in emissions due to the reform of agricultural enterprises.

The trend of GHG emissions from 1988 to 2018 shows a decrease of 53.40 % for this sector due to decrease in activity data. (Figure 7).

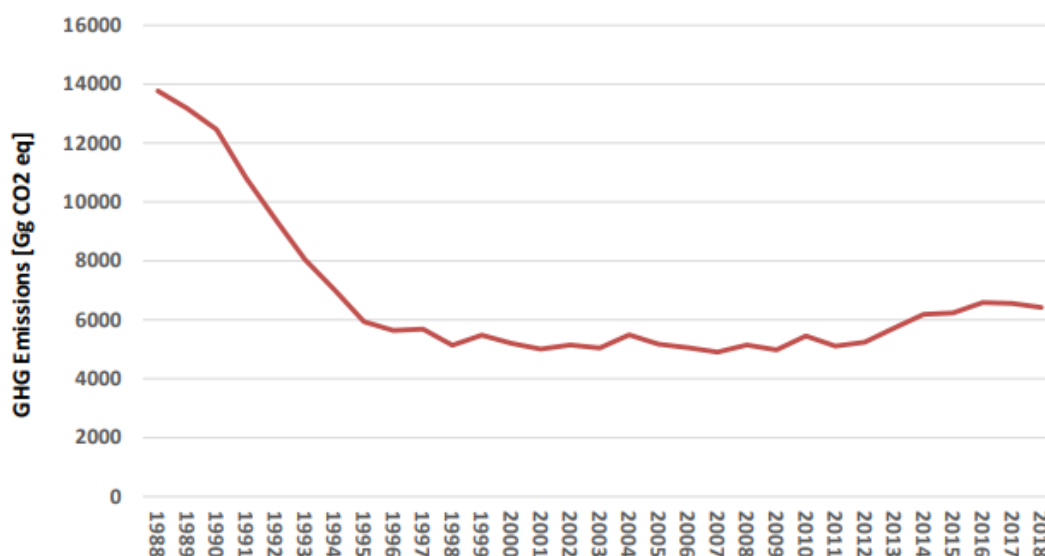


Figure 7 Trend of GHG Emissions from agriculture sector

CH₄ emissions are 27% from of the total emissions in the sector in CO₂-eq in 2018. Methane emissions are 36% from of the total emissions in the sector in 2009. A steady trend of emissions decrease is observed after 2002 due to reduction in animal numbers. The domestic livestock activities with enteric fermentation is the largest source of methane emissions (such as CO₂-eq.) – 21.9% of the sector’s emissions. In 2004, CH₄ emissions (such as CO₂-eq.) were 1 491.5 Gg., which is about 2% of the total GHG emissions. In 2004 is observed slight decrease by 0.7% compared to the 2003, due to weak distribution of the main animal types.

N₂O emissions from the sector are also significant. The share of N₂O emissions is 73% for the year 2018. The biggest share in these emissions has the agricultural soils category with 89,63%, which shows an increase compared to 2004 (87%), but there is a steady trend for the whole period 1988-2003, when the share remains in the range of 83-88%. N₂O emissions from manure management and field burning of agricultural residues are an order of magnitude smaller and in total are about 13 - 15% of the total N₂O emissions from the sector.

Since 1988 the CH₄ emissions from agriculture decreased by 71% and N₂O emissions by 40%. CH₄ emissions were 69,47 Gg in the year 2018. The decrease for the year 2018 is 0.88% compared to 2017. N₂O emissions decrease from 16.01 Gg in 2017 to 15.59 Gg in 2018 year.

The trend of GHG emissions from agriculture for the period 1988-2018 is shown in table 5.

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Table 5 Trend of GHG emissions from agriculture for the period 1988-2018

Year	GHG emissions(Gg)		
	CH ₄	N ₂ O	CO ₂
1988	237.14	26.10	62.17
1990	225.78	22.72	45.49
1995	105.95	10.97	14.88
2000	91.99	9.69	16.65
2005	82.92	10.33	18.32
2010	73.21	12.10	18.05
2015	71.53	14.82	31.27
2016	71.01	16.02	35.93
2017	70.16	16.02	33.42
2018	69.47	15.59	33.74

Figure 8 shows trend 1988-2018 from agriculture by sub-categories:

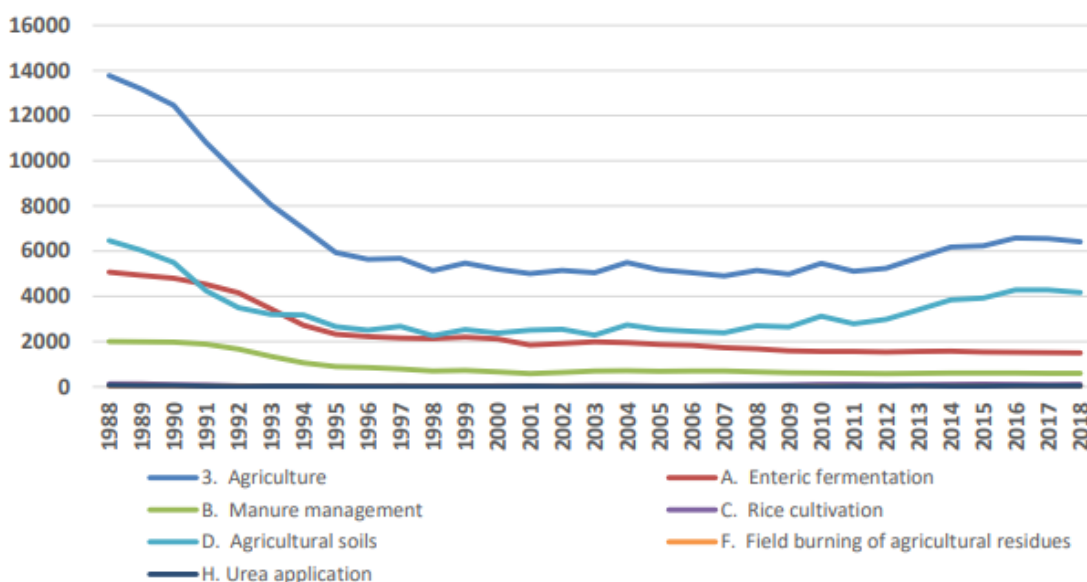


Figure 8 Trend 1988-2018 from agriculture by sub-categories

Figure 8 and Table 6 present total GHG emissions and trend 1988–2018 from agriculture by sub-

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categories as well as the contribution to the overall inventory emissions. Important categories are 3.D Agricultural soils (65%) and 3.A Enteric Fermentation (23%) followed by 3.B Manure management (9%).

Table 6 GHG emissions 1988–2018 of agriculture by categories

Year	GHG emissions (Gg CO ₂ -equivalent) by categories						
	3	3.A	3.B	3.C	3.D	3.F	3.H
1988	13767.95	5071.20	2000.60	126.99	6469.60	37.40	62.17
1990	12461.57	4804.54	1974.49	95.37	5504.10	37.57	45.49
1995	5933.28	2329.68	889.46	12.43	2663.21	23.62	14.88
2000	5205.33	2112.83	651.98	32.16	2375.37	15.34	16.65
2005	5170.04	1869.65	688.32	40.53	2532.89	20.33	18.32
2010	5454.64	1566.57	610.19	107.87	3125.78	26.17	18.05
2015	6236.25	1535.49	606.12	111.77	3919.58	32.02	31.27
2016	6585.68	1521.87	604.38	107.97	4282.63	32.91	35.93
2017	6555.36	1512.39	594.70	93.97	4286.05	34.82	33.42
2018	6415.69	1490.19	593.65	99.10	4163.41	35.59	33.74
Total for 2018 in %	-	23.23%	9.25%	1.54%	65.85%	0.55%	0.53%

As can be seen in Figure 8 and Table 6, the overall trend for emissions in the most categories is decreasing. The reasons for the decrease are structural changes in agricultural holdings which lead to reduction in farm animal populations and decrease in arable land area.

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3.2. BLAGOEVGRAD REGION

3.2.1. TERRITORIAL SCOPE

According to data from the Regional Report of the Environmental conditions for 2019 issued by RIEW Blagoevgrad, Blagoevgrad region is located in the south-western part of the territory of Republic of Bulgaria on an area of 6452.3 km² (5.8% of the country's territory). This region is located between Kyustendil, Sofia, Pazardzhik and Smolyan regions and the state borders with Greece and Macedonia. It consists of 13 municipalities (Blagoevgrad, Simitli, Kresna, Strumyani, Sandanski, Petrich, Yakoruda, Belitsa, Razlog, Bansko, Gotse Delchev, Garmen and Hadzhidimovo). Blagoevgrad region is located on the borders with two neighboring countries (Greece and Macedonia), which is a prerequisite for development of active cross-border cooperation. The connection with Greece is through the Kulata border checkpoint and the Ilinden border checkpoint, and with Macedonia through the Zlatarevo border checkpoint and the Stanke Lisichkovo border checkpoint.

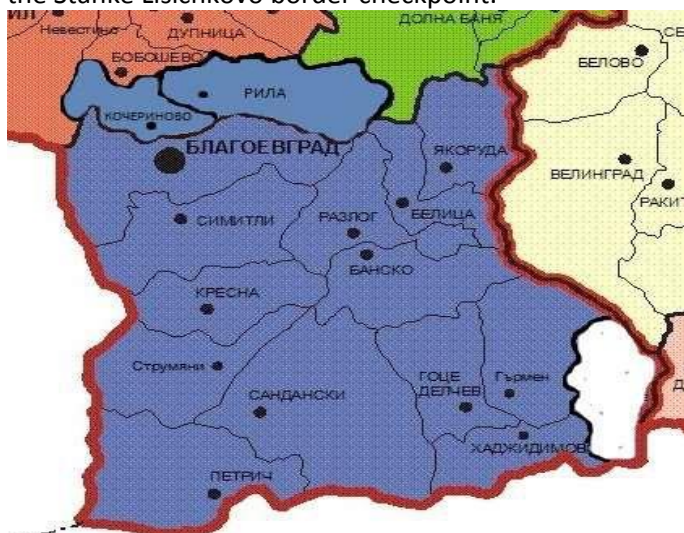


Figure 9. Regional map of Blagoevgrad region
Physico-geographical and economical characteristics:

According to the Regional Report on the Environmental conditions in 2019 issued by RIEW Blagoevgrad, the region is characterized by a diversified economic structure. The general condition of the environment in the controlled area is good. The area includes the valleys of the rivers Struma and Mesta, Pirin mountain, as well as parts of the mountains Rila, Rhodope, Slavyanka, Belasitsa, Ograzhden, Maleshevska and Vlahina, which is a prerequisite for significant diversity of relief. There are no major industrial pollutants. The largest operating plants are in the field of food and processing industry, textile industry, wood processing and furniture industry, metalworking, coal mining, extraction and primary processing of construction and rock

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facing materials and others.

The diverse climatic, geological and hydrological conditions, the unique flora and fauna, the rich diversity of species, communities and natural habitats, as well as the fact that the territory includes National and Natural Parks of great importance for preserving the natural character of natural ecosystems and landscapes have great potential for the development of tourism and for the conservation of rich biodiversity of pan-European importance.

The urban development in the region has as its main axis of development the direction Sofia - Blagoevgrad - Kulata and a secondary axis of development - the direction Simitli - Razlog - Gotse Delchev - Ilinden. The strategic location along the European transport corridors, the border with two countries and the well-developed network of regional and local transport infrastructure are potential for cross-border cooperation. The construction of the Struma Highway has an important role in improving the connectivity of the region and in increasing the economic importance, especially in its southern part. Accessibility to rail transport and the presence of four border checkpoints is of great economic importance for the development of the region. The transport connections are mainly on the main road E-79 and the electrified railway line CE-855, which are part of interstate corridors. The gas supply infrastructure under construction is a major factor for sustainable development of the region. A main gas pipeline to Greece passes through the territory. In recent years, the gasification of the larger town of Blagoevgrad, Petrich, Sandanski, Razlog, Bansko and Gotse Delchev has been intensified.

3.2.2. ANALYSIS OF THE MAIN COMPONENTS OF THE ENVIRONMENT

3.2.2.1 CLIMATE AND AMBIENT AIR

According to the Regional Report on the State of the Environment in 2019, issued by RIEW Blagoevgrad and data from the Regional Strategy for Regional Development 2014 - 2020 of Blagoevgrad District, the climate has a strong Mediterranean influence along the Struma, Strumeshnitsa and Mesta rivers. There are different climatic conditions in the district - temperate-continental transitional-continental, transitional-Mediterranean and Mediterranean climate. This determines suitable conditions for growing a large number of heat-loving Mediterranean plant species, unlike other regions of the country. The conditions for irrigation and reclamation in the river valleys are good. **The soil conditions are good for growing tobacco, vineyards, orchards, heat-loving crops, herbs, mushrooms and more. Particularly characteristic of the area are the prolonged summer droughts in the lowlands, and precipitation is below the national average and is unevenly distributed over seasons and months. This creates problems, requires irrigated agriculture and makes agricultural production more expensive. Late spring and early autumn frosts cause serious damage to vegetables, tobacco and fruit trees.** Blagoevgrad region is characterized by exceptional diversity of relief, as well as valley relief in the region of Blagoevgrad valley, the valley of the river Struma. It includes all or parts of the highest mountains in our country - Rila, Pirin and Rhodope, where are located areas with alpine, mid-mountain and foothill relief. Although with a lower

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altitude, but also with mountainous relief are part of the territories of Vlahina, Maleshevska, Ograzhden, Belasitsa and Slavyanka mountains.

3.2.2.2. AMBIENT AIR QUALITY

According to data from the regional reports on the environmental conditions, issued by RIEW Blagoevgrad for 2017, 2018 and 2019, the ambient air quality in the municipality of Blagoevgrad is assessed by analyzing the data obtained from the monitoring point (AMS - Blagoevgrad) and comparison with the measured concentrations for the controlled pollutants with the air quality standards set in the normative acts (national and EU).

According to the requirements of art. 11, Annex № 6 of Ordinance № 12 of 2010 for standards for sulfur dioxide, nitrogen dioxide, fine particulate matters, lead, benzene and ozone in ambient air, AMS - Blagoevgrad is categorized as an urban background point located in the built-up area of the city, without a predominant influence of emissions from production and other activities. The range of AMS - Blagoevgrad is from 100 m to 2 km, the station is located on the site of the Hydrometeorological Observatory - Blagoevgrad to NIHM-BAS, Kyustendil branch.

AMS - Blagoevgrad controls the main indicators for air quality under Art. 4 of the Atmospheric Air Purity Act (Directive 96/62 / EC) - PM₁₀, SO₂, NO₂, benzene, surfactants, NO, O₃, two additional (Toluene and P-Xylene), is also equipped with a standard set of meteorological parameters SSMP). The tests are performed according to - BSS ISO 10 473, BSS EN 14 212, BSS EN 14 211, BSS EN 14 625, BSS EN 14 662-2. SSMP includes the determination of meteorological parameters: wind direction and speed, temperature, pressure, humidity and strength of sunshine.

The analysis of the data for the period 2017-2019 shows that in 2017 and 2018. the levels of the main indicators for the ambient air quality are below the established norms for protection of human health with the exception of PM₁₀. Till 31 December 2019, the levels of the controlled main indicators for the quality of the ambient air are below the established norms for protection of human health. In 2017, AMS-Blagoevgrad did not register any exceedance of the average daily, average hourly and average annual norms for indicators: nitrogen dioxide and ozone. There were registered two exceedances of the average daily norm and four exceedances of the average hourly norm for sulfur dioxide. In 2018, AMS-Blagoevgrad did not register any excess of the average daily, average hourly and average annual norms for indicators: nitrogen dioxide, sulfur dioxide and ozone. In 2019, AMS-Blagoevgrad did not register any exceedance of the average daily, average hourly and average annual norms for the indicators nitrogen dioxide and sulfur dioxide. For 2019, one exceedance of the short-term target norm (STTN) for protection of human health in terms of ozone has been registered.

The number of exceedances of the threshold values of the average daily norm (TV of the ADN) for PM₁₀-50 µg/m³ exceeds the permissible under Ordinance №12 / 2010 for 2017 and 2018. In 2019 the registered exceedances of the ADN of PM₁₀ is 33 pcs, which is below the statutory number of exceedances - 35 pcs. for one calendar year.

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Exceedances in terms of fine dust particles are registered mainly during the winter heating season, and this is due to the widespread use of solid fuels for heating in the domestic sector, transport traffic and the typical windless weather, fog, temperature inversions, creating conditions for retention and accumulation of atmospheric pollutants in the ground layer.

In 2019, there is a decrease in the average monthly concentrations of PM₁₀, compared to 2017 and 2018. Compared to 2017, in 2018, the number of days exceeding the average daily norm for PM₁₀ increased by 3%. Compared to 2017 and 2018 in 2019, the number of days exceeding the average daily norm for PM₁₀ has decreased by 50%.

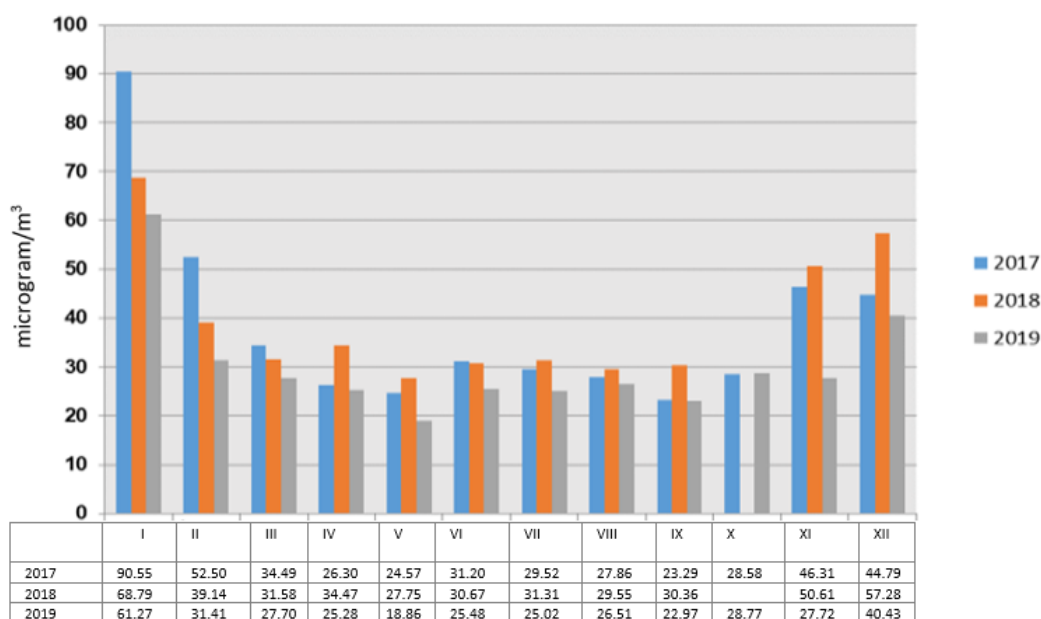


Figure 10. Distribution of the average monthly concentrations of PM₁₀ - 2017, 2018 and 2019

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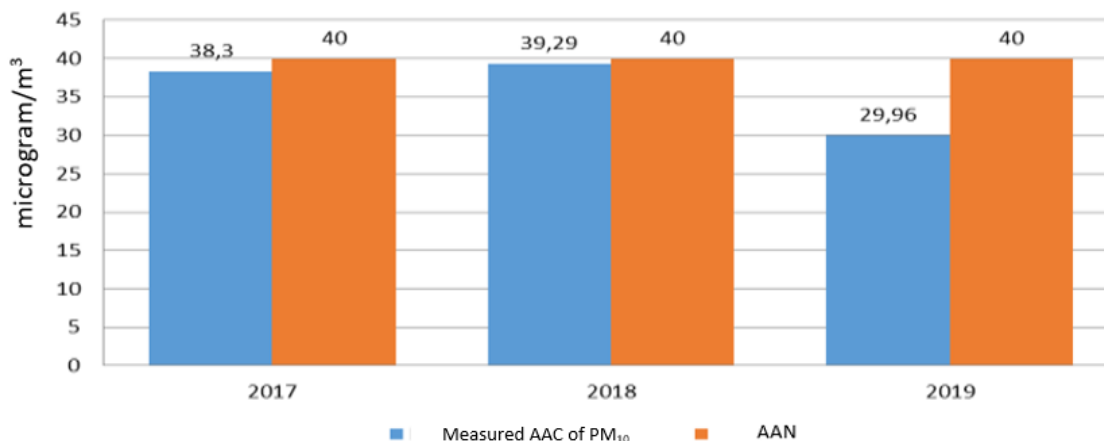


Figure 11. Measured average annual concentrations of PM₁₀-2017, 2018 and 2019, compared to AAN

In connection with the commitments of the Republic of Bulgaria to ensure the achievement of the established norms for the quality of the ambient air and under the requirements of art. 27 of the Atmospheric Air Purity Act, the Municipality of Blagoevgrad has developed and is implementing a Program for reduction of harmful emissions into the air (PM₁₀) and polycyclic aromatic hydrocarbons on the territory of the town of Blagoevgrad. Municipality of Blagoevgrad has also developed and an action plan, with a period of action 2015 – 2018.

With decision №265 / 28.09.2018 of the Municipal Council - Blagoevgrad was adopted "Update of the municipal program for air quality and reaching the established norms of fine dust particles (PM₁₀) and polycyclic aromatic hydrocarbons (surfactants) on the territory of Blagoevgrad municipality, with a period of validity 2019-2023". In 2019 and 2020 the Municipality of Blagoevgrad continues to implement the measures set in the "Update of the municipal program for air quality and achievement of the established norms of fine dust particles (PM₁₀) and polycyclic aromatic hydrocarbons (surfactants) of the territory of the municipality of Blagoevgrad, with a period of validity 2019-2023. "

3.2.2.3. SOURCES OF AIR EMISSIONS

The control of sites and activities with fixed sources of emissions in the ambient air carried out by RIEW-Blagoevgrad in the period 2017 - 2019 covers about 100 sites with over 170 fixed sources of emissions. All operating sites are included in a plan for monitoring activities and given their number and the provisions of Art. 25, para. 3 of the AAPA, the sites are inspected at least once every two years.

In 2019, 116 inspections were carried out on the implementation of the Atmospheric Air Purity Act and 3 acts were drawn up for the establish administrative violations.

In 2019, measurements were made of 96 fixed sources of emissions in a total of 41 sites.

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Till 31.12.2019 two enterprises (“Bulgartransgaz” EAD, city of Sofia for site: Compressor station - Petrich and “Blagoevgrad BT” AD, town of Blagoevgrad, for a fuel installation with a nominal heat output of 28 MW in a Tobacco Products Factory, Blagoevgrad) are falling within the scope of art. 34, para. 2 of the Atmospheric Air Purity Act and having issued a Greenhouse Gas Emission Permit (GGEP) within the territorial scope of RIEW – Blagoevgrad. In 2019, the GGEP of “B and VGD Greenhouses – Petrich” OOD, town of Petrich, operator of the Installation for production of heat for the purposes of a greenhouse complex and production of electricity for the production of vegetables, was repealed by Decision № 158- H0-I0-A1-O / 2019 of the Director of the EEA - Sofia.

In 2017 and 2018 were performed 45 inspections, and in 2019 - 57 inspections of sites operating equipment (refrigeration, air conditioning and heat pump installations) with fluorinated greenhouse gases, ozone depleting substances and users of fluorinated greenhouse gases. During the inspections no violations of the regulatory framework were found. The 23 pcs. prescriptions given in 2019 for submission of additional information and updating of the documentation available at the sites have been fulfilled within the deadlines indicated by the experts of the competent authorities.

3.2.3. WATER

3.2.3.1. SURFACE WATER PROTECTION

The water resources of the district are formed by the main rivers Struma and Mesta and their numerous tributaries - Blagoevgradska Bistritsa, Pirinska Bistritsa, Lebnitsa, Strumeshnitsa, Belishka river, Demyanitsa, Kanina, Bistritsa, Tufcha, etc., as well as over 160 circus lakes in Pirin, karst springs in Pirin and Slavyanka.

The protection of surface water from pollution along the Struma and Mesta rivers is carried out by controlling emitters, which release priority and priority hazardous substances, specific pollutants and / or other substances with their wastewater. These substances may impact and change the main parameters characterizing the condition of water bodies.

The performed inspections of the operating town wastewater treatment plants (WWTP) in the settlements of Blagoevgrad, Razlog and Bansko has been established that they are maintained in good condition.

From the performed inspections of smaller enterprises with local treatment facilities it was established that they work periodically and with disturbed regime of the treatment facilities. Difficulties and problems in the operation of the facilities are mainly due to financial and organizational reasons caused by the irregular operation of the main productions. In some cases, the necessary repairs and replacement of depreciated machines and equipment are carried out in a timely manner.

Prescriptions were issued in a timely manner for the identified irregularities and inspections for

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their implementation were carried out. Acts have been drawn up and property sanctions and fines have been imposed for the established violations.

3.2.3.2. SURFACE WATER MONITORING

Surface water monitoring provides information on the processes, changes and phenomena in surface water. The monitoring is performed in order to provide complete and comprehensive information on the quality of all elements necessary for the performance of the following water management activities:

- assessment of anthropogenic pressure;
- assessment of the impact on surface water bodies;
- confirmation of the risk assessment for failure to achieve the objectives;
- assessment of the ecological and chemical condition of the surface water bodies;
- development of future monitoring programs;
- assessment of the effect of the implemented programs of measures for improvement or prevention of deterioration of the condition;
- identification of the reasons why water bodies will not achieve the set goals;
- assessment of compliance with the standards and objectives of the protected areas.

The obtained information gives an idea for the extent to which the respective water body can achieve the set objectives for good status.

The monitoring of the ecological and chemical condition of the surface water bodies in the territorial scope of Blagoevgrad region was carried out in compliance with Orders of the Minister of Environment and Water. Sampling and subsequent physico-chemical and hydrobiological analyzes were performed by the Blagoevgrad Regional Laboratory (RL), branch of EEA. The performed researches are based on the following indicators and quality elements, related to the ecological and chemical condition of the surface water bodies:

- main physico-chemical pollutants, including elements for quality for oxygen regime - pH, BOD₅, electrical conductivity, saturation and dissolved oxygen, nutrients - ammonium nitrogen, nitrite nitrogen, nitrate nitrogen, total nitrogen, ortho-phosphates and total phosphorus;
- specific pollutants - copper, zinc, arsenic, cyanides, chromium, iron, manganese, etc .;
- priority substances from Annex № 1 of the Ordinance on standards for environmental quality for priority substances and certain other pollutants;
- hydrobiological quality elements - macrozoobenthos, macrophytes and phytobenthos.

Based on the results of the monitoring, an assessment was made of the ecological and chemical status of surface water bodies in the territorial scope of RIEW - Blagoevgrad.

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The region is characterized by a diversified economic structure. The general condition of the environment in the controlled area is good. There are no major industrial pollutants.

3.2.3.3. SOURCES OF WASTEWATER AND CONDITION OF THE TREATMENT FACILITIES

The main sources of wastewater are urban sewerage networks and larger industrial sites discharging wastewater into urban sewers. In 2016 between the Association of Water Supply and Sewerage Blagoevgrad and the current operator "Water and Sewerage" EOOD Blagoevgrad was signed a contract for management, maintenance and operation of water supply and sewerage systems and facilities and provision of water supply and sewerage services on the territory of the region. The municipalities of Kresna and Sandanski are not included within the scope of the designated territory. On the territory controlled by RIEW Blagoevgrad are located 3 operational municipal wastewater treatment plants - WWTP Blagoevgrad, WWTP Razlog and WWTP Bansko.

The constructed and put into operation WWTPs of agglomerations under 2000 eq. residents: WWTP "Gabrene" - Petrich municipality and WWTP "Mihnevo" - Petrich municipality, WWTP "Cherniche" - Simitli municipality are not handed over for operation to "Water and Sewerage" operator and do not work. WWTP "Yurukovo" - Yakoruda municipality and WWTP Dagonovo and Gorno Kraishte" - Belitsa municipality are handed over to a water supply and sewerage operator and work efficiently. The constructed local treatment plants and facilities are maintained in a satisfactory technical and operational condition.

Sites that form emissions of priority and priority hazardous substances, general and specific pollutants discharging into water bodies are included in the "Information system for permits and monitoring in water management" according to a list approved by the Minister of Environment and Water. The control is carried out jointly with Regional Laboratory – Blagoevgrad, branch of EEA - Sofia obligatorily twice a year, except for the sewerage collectors without constructed treatment plants and the sites with seasonal mode of operation, which are controlled once a year.

The largest operating sites are in the field of food and processing industry, textile industry, wood processing and furniture industry, metalworking, coal mining, extraction and primary processing of construction and rock facing materials and others.

Sites, sources of industrial wastewater, with constructed WWTP and treatment facilities

- WWTP Blagoevgrad - The site is included in the list for mandatory monitoring for the period 2017 - 2019. Purifies the domestic and industrial wastewater of Blagoevgrad.
- "Carlsberg Bulgaria" AD, Sofia, Brewery - Blagoevgrad - The site is included in the list of mandatory monitoring for the period 2017 - 2019. In the second half of 2015, a local WWTP was built on the site to treat the company's wastewater in accordance with the requirements of the contract concluded with the Water and Sewerage Operator. No violations were found in 2017 and 2018. A property sanction has been

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imposed on the company in 2019 for non-compliance with the maximum permissible concentrations of pollutants in industrial wastewater defined in the IPPC permit (Integrated Pollution Prevention and Control permit).

- “Wine Cellar - Villa Melnik” EOOD, village of Harsovo, WWTP to a grape processing enterprise by distillation and fermentation, village of Harsovo. The discharge of the mixed stream - industrial and domestic wastewater is in a gully, which is tributary of river Melnishka. The site is included in the list for mandatory monitoring for the period 2017 - 2019. For 2017 and for 2018, deviations from the individual emission limits (IEL) set in the permit for discharge have been established. An penalty decree has been issued for non-compliance with the IEL. For 2019, deviations from the individual emission limits (IEL) set in the permit for discharge have been established. Actions have been taken to comply with the IEL.
- “Damyanitsa” AD, Damyanitsa village, Damyanitsa winery - The site is included in the list for mandatory monitoring for the period 2017 - 2019. The wastewater discharge is in a drainage channel, draining the water in the Struma River. The company has built a new WWTP for treatment of domestic and industrial wastewater, located on the site. No sanctions were imposed in 2018 and 2019.
- ET "Fashion top models - Dimitrina Kalambova" city of Blagoevgrad, unit for bottling of spring water and soft drinks in locality "Karkolitsite", land of Rila Monastery - The discharge of industrial wastewater from the site is carried out at the exit of a treatment plant - dechlorinator, according to the requirements of a permit for use of a water body (gully), a tributary of the Rilska river. The object works irregularly. In 2017, no violations were found. No inspection was performed during the monitoring period 2018 and 2019.
- “Ecoengineering RM” EOOD, Sofia, WWTP "Zvezda", village of Eleshnitsa WWTP was built in connection with the liquidation of uranium mining under the PHARE program. There is a permit for discharge of water from the WWTP. The site is included in the list for mandatory monitoring for the period 2017 - 2019. No violations were found during the reporting period.
- ET "Vekir- Radka Belezhkova" EOOD, Godlevo village, Milk processing plant in the village of Godlevo. Wastewater is treated in a local treatment plant. A permit for discharge in Radonovets river, Mesta Valley has been issued. The site is included in the list for mandatory monitoring for the period 2017 - 2019. No violations of IEL were found in the period 2017-2019.
- Razlog Municipality through “Razlog Regional Depot”, Regional landfill for non-hazardous waste - Razlog, serving the municipalities of Razlog, Bansko, Yakoruda, Belitsa. Razlog municipality is the operator of the IPPC permit. A WWTP for domestic

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wastewater and a WWTP, which treats infiltrated wastewater, have been built on the site. Razlog Regional Depot performs its own monitoring according to the requirements of the IPPC permit. No violations were found in the period 2018-2019.

Sites for which treatment facilities are needed

In practice, wastewater is discharged from the sewerage collectors of the settlements without the necessary treatment, as a result of which IEL on biodegradable indicators are not observed and the surface water intakes are loaded and their ecological condition deteriorates. The achievement of IEL completely depends on the term for construction of wastewater treatment plants (WWTP) for the respective agglomeration. The program for construction of urban WWTPs is not provided at the national level.

Sites that have built up WWTPs and work effectively in 2019

- "26-st of May " EOOD Blagoevgrad, WWTP for galvanic workshop;
- "Carlsberg Bulgaria"AD, city of Sofia, Blagoevgrad Brewery
- Regional Depot for non-hazardous waste Razlog;
- "Ecoengineering RM" EOOD, city of Sofia, site in Eleshnitsa village.

Sites with built up WWTP and local treatment facilities, which did not work effectively in 2019

- "Ecoreplast" EOOD, Sofia, Workshop for recycling of waste plastics in the village of Kapatovo;
- "Groma Hold" EOOD, Belo Pole village, Crushing and washing sorting installation and concrete center in Belo Pole village, Blagoevgrad Municipality.

Condition of hydraulic facilities (dikes, dam walls, etc.)

Within the borders of the urbanized territories, the municipalities make efforts for the cleaning of the river beds. The corrected sections, located within the boundaries of the settlements and managed by the municipalities, are in good functional condition, and when necessary measures and activities are taken for their maintenance.

In 2019, for the corrected river sections, managed by "Irrigation Systems" EAD, "Struma - Mesta" branch, is applied up to-date statistics on their functionality and measures for maintenance of their good technical and operational condition are outlined. For most of the damaged hydraulic systems, project documentation has been prepared for their restoration. For the most crisis areas, projects have been prepared and submitted to the Interdepartmental Commission for Assistance and Restoration.

During the reporting period for sections of Struma River located on the territory of the municipalities of Blagoevgrad, Simitli, Strumyani and Petrich, restoration and strengthening activities were carried out. The activities are implemented under the project "Flood Protection", approved for financing, according to Contract №B3.5b.01 / 11.09.2017 under the INTERREG VA Program Greece - Bulgaria 2014 - 2020.

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3.2.3.4. ASSESSMENT OF THE STATUS OF SURFACE WATER BODIES, INCLUDING ASSESSMENT OF THE ECOLOGICAL STATUS AND ASSESSMENT OF THE CHEMICAL STATUS.

Tables 7 to 10 provide an up-to-date assessment of the status of surface water bodies in Blagoevgrad region, including an assessment of the ecological and chemical status assessment.

Table 7. Assessment of the ecological status / potential of surface water bodies in the Struma River valley for 2019

Condition / potential of surface water bodies under Ordinance H-4/2012	Overall assessment of the ecological condition / potential for 2019	Share of the total number of surface water bodies in the Struma river basin in the range of RIEW - Blagoevgrad, in%
excellent	22	33 %
good	19	28 %
moderate	11	16,5 %
bad	6	9 %
Very bad	1	1,5 %
No monitoring was conducted in 2019	8	12 %
Total number of surface water bodies in the Struma river basin within the scope of RIEW - Blagoevgrad	67	100%

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Table 8. Assessment of the ecological status / potential of surface water bodies in the Mesta River valley for 2019

Condition /potential of surface water bodies under Ordinance H-4 /2012	General assessment of the ecological condition /potential for 2019	Share of the total number of surface water bodies in the Mesta river valley in the range of RIEW – Blagoevgrad, in%
excellent	12	24 %
good	11	22 %
moderate	12	24 %
bad	3	6 %
Very bad	1	2 %
No monitoring was conducted in 2019	11	22 %
Total number of surface water bodies in the valley Places in the range of Mesta river; RIEW - Blagoevgrad	50	100%

Table 9 Assessment of the chemical status of surface water bodies in the Struma River valley for 2019

Chemical status for 2019 of the surface water bodies under the Ordinance for Environmental Quality Standards(EQS) /2012	Assessment of the chemical condition for 2019	Share of the total number of surface water bodies in the Struma river basin in the scope of RIEW - Blagoevgrad, in%%
Good	36	54 %
Unattainable good	0	0 %
There are no monitoring data in 2018	31	46 %
Total number of surface water bodies in the Struma river basin in the range of RIEW - Blagoevgrad	67	100 %

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Table 10 Assessment of the chemical status of surface water bodies in the Mesta River valley for 2019

Chemical status for 2019 of surface waterbodies under the EQS Ordinance / 2012	Assessment of the chemical condition for 2019	Share of the total number of surface water bodies in the Mesta river valley within the scope of RIEW - Blagoevgrad, in%
Good	21	42%
Unattainable good	0	0 %
There are no monitoring data in 2018	29	58 %
Total number of surface water bodies in the Mesta river valley within the scope of RIEW - Blagoevgrad	50	100 %

3.2.4. GROUNDWATER PROTECTION

For the purposes of the River Basin Management Plan (RBMP) for (2016-2021), within the project "Study of transboundary groundwater bodies between the Republic of Bulgaria and the Republic of Greece" BG-GR-GWB, implemented with the financial support of the Financial Mechanism of the European Economic Area (EEA FM)), with the beneficiary the Geological Institute of BAS and partners WABD and EABD was made fusion and/or separation of the boundaries of some groundwater bodies. The total number of groundwater bodies has been changed from 39 to 38. The consolidation (defragmentation) of the boundaries of groundwater bodies in the West Aegean region will improve their management during the period of operation of the RBMP of the WABD 2016-2021, their assessment of the quantitative and chemical status, as well as the implementation of more appropriate measures where necessary.

Given the storeys of the aquifers, the dissected relief and the colorful mosaic of geological formations, in the West Aegean region for basin management are formed all the main types of groundwater - cracked, karst (karst-cracked) and porous. Depending on the type of reservoir, the water-containing geological structure, the nature and conditions of drainage and feeding, and the connection with surface water bodies, the groundwater bodies are divided into the following types:

- Water bodies in the alluvial deposits of the rivers;
 - BG4G00000Q001 - Porous waters in the Quaternary - Strumeshnitsa;
 - BG4G00000Q002 Porous waters in the Quaternary - Kresna-Sandanski
 - BG4G00000Q003 Porous waters in the Quaternary - Simitli
 - BG4G00000Q004 Porous waters in the Quaternary - Blagoevgrad

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- BG4G00000Q008 Porous waters in the Quaternary - Razlog
- BG4G00000Q009 Porous waters in the Quaternary - Gotse Delchev
- Water bodies in graben-shaped depressions;
 - BG4G00000N011 Porous waters in the Neogene - Strumeshnitsa
 - BG4G00000N012 Porous waters in the Neogene - Sandanski
 - BG4G00000N013 Porous waters in the Neogene - Simitli
 - BG4G00000N014 Porous waters in the Neogene - Blagoevgrad
 - BG4G00000N016 Porous waters in the Neogene - Razlog
 - BG4G00000N017 Porous waters in the Neogene - Gotse Delchev
- Cracked water bodies;
 - BG4G0001Pg018 Porous-cracked waters in Gotse Delchev Paleogene aquifer
 - BG4G0001Pg038 Porous-crackedwaters in Paleogene sedimentary complex on the eastern slopes of Vlahina Mountain
 - BG4G1PzC2Pg019 Crackedwaters in Pirin block
 - BG4G001PzC2021 Cracked waters in Rila-Rhodope metamorphites, South Bulgarian granites, Kalinski pluton
 - BG4G001PtPz025 Cracked waters in Belasitsa metamorphites
 - BG4G001PtPz026 Cracked waters in South Bulgarian granites, Western Rhodope metamorphites, Barutinbuin intrusive
 - BG4G001PtPz125 Cracked waters in Vlahino-Ograzhden-Maleshevsko-Osogovo metamorphites
- Water bodies in areas with karst basins, located in areas with spread of cracked collectors;
 - BG4G0001Pt1030 Cracked-karst waters in Satovcha karst basin
 - BG4G0001Pt1036 Cracked-karst waters in Gotse Delchev karst basin, Teshovo pluton
- Water bodies in separate karst basins.
 - BG4G000Pt3031 Karst waters in Razlog karst basin

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- BG4G000Pt3032 Karst waters in the Vlachinski karst basin
- BG4G00T1T2033 Karst waters in the Logodashki karst basin

Groundwater monitoring provides information about the processes, changes and phenomena taking place in water bodies, necessary for their optimal management. Based on the results of the monitoring, an assessment was made of the ecological and chemical status of the groundwater bodies in the territorial scope of RIEW - Blagoevgrad.

3.2.4.1. ASSESSMENT OF THE CHEMICAL STATUS OF GROUNDWATER BODIES:

Assessment of the chemical status of the groundwater bodies in the West Aegean region is made on the basis of the measured concentrations for the various pollutants in the monitoring points included in the monitoring programs of the West Aegean Basin Directorate and data from own monitoring of holders of permits for groundwater abstraction. The average annual values of the concentrations at each point were calculated separately and as a whole. They are compared with the quality standards for these pollutants given in Annex №1 to Art. 10, para. 2, point 1 of Ordinance №1 / 2007 - For research, protection and use of groundwater.

The main physical and chemical parameters such as pH, oxygen regime - oxygen saturation, dissolved oxygen, electrical conductivity, permanganate oxidizable, nutrients - ammonium, nitrates, nitrites, orthophosphates are observed in the points for chemical monitoring. There are also observed number of specific pollutants such as cyanides, iron, manganese, copper, zinc, arsenic, total chromium, organic substances, priority substances, pesticides and others.

All the above mentioned indicators are used to assess the chemical status of the monitored points, and subsequently –for the respective groundwater body in relation to the pollution thresholds (PT) and quality standards (EQS) for the respective pollutant, specified in Annex № 1 of Ordinance №1 / 2007 - For research, protection and use of groundwater.

3.2.5. LANDS AND SOIL

3.2.5.1. TERRITORIAL INFORMATION BY MUNICIPALITIES

Information about the territory of RIEW - Blagoevgrad by municipalities, compared to the available master development plans (Blagoevgrad, Sandanski, Bansko, Razlog, Yakoruda, Gotse Delchev), drafts of the master development plans and municipal development plans 2014-2020 for municipalities.

Blagoevgrad Municipality: has total area of 621,000 decares, of which 285,961 decares with agricultural lands (178 861 decares with pastures, meadows and 107,100 decares with arable land). From those areas actually 65% or 69,615 decares are cultivated. The forest territories are 271,788 decares, water areas - 6,615 decares, territories for transport and infrastructure - 2,388 decares. Predominant soil types are: cinnamon-mountain soils, brown forest soils in the belt 1000 - 2 000 m above the sea level, mountain-meadow soils on the highest parts of the mountains, alluvial and deluvial soils along the rivers. The disturbed territories in the

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municipality - by 2019 there are 5 existing concessions for extraction of mineral resources and inert construction materials. The order and the manner of recultivation of the disturbed terrains from this activity is set in the Mineral Resources Act.

Simitli Municipality: has total area of 533,000 decares, of which 350,700 decares with forest areas. The soil types is represented by cinnamon soils up to 700-800 m above the sea level in the mountain foothills and slopes, brown forest soils in the range of 800-1500 m above the sea level, distributed in a complex with cinnamon forests and brown forest soils and alluvial meadow soils along the Struma River and its tributaries. The disturbed territories are 2 pcs. coal concessions, 1 pc. for inert construction materials.

Municipality of Kresna: has total area 344,000 decares. Industry in the municipality has secondary importance in the economic structure of Kresna municipality. Crop and animal husbandry have extensive character.

Municipality of Strumyani: has total area 362,000 decares, of which agricultural lands are 127,006 decares or 35.8% of the area of the municipality, of which 72,065 decares with arable land or 56.75% of the agricultural lands, forest territories are 21,803 decares or 59.7%. Soil types are: brown forest soils 24.9%, cinnamon forest soils up to 900 m above the sea level, alluvial-meadow and deluvial soils along the valley of the Struma River and its tributaries. Erosion processes are mostly in the forest areas. The disturbed territories are - one concession for extraction of inert construction materials, three concessions for extraction of marble.

Municipality of Sandanski: has total area of 997,300 decares, of which 569,790 decares forest areas or 54% of the area, arable land 35%, meadows and pastures - 170,000 decares. (Master development plan of Sandanski municipality) includes a large part of the picturesque Sandanski-Petrich valley along the middle course of the Struma River and the western and southwestern slopes of the three parts of Pirin, the northern slopes of Slavyanka mountain and the lowest foothills of Maleshevska and Ograzhden mountain. The disturbed territories are 4 pcs. concessions for extraction of inert construction materials.

Municipality of Petrich: the soil cover is represented by alluvial meadow soils on the terraces of the Struma and Strumeshnitsa rivers, deluvial meadow soils at the foot of the Ograzhden and Belasitsa mountains, cinnamon forest soils up to 700-800 m above sea level and brown forest soils above 800 m above sea level.

Municipality of Yakoruda: has total area of 339,276 decares, of which: agricultural territories 109,402 decares, or 32.25% of the area, forest territories 210,002 decares, or 61.9%, urbanized territories - 4,274 decares or 1.26%, water currents - 1,488 decares, for transport and infrastructure - 1,497 decares, for extraction of mineral resources - 17 decares. Common soil types are: brown forest soils (in the range 700-1200 m above the sea level), mountain-forest dark-colored soils (1 200-2 000 m above the sea level) and mountain-meadow soils (2 000-2 500 m above the sea level). According to the municipal development plan for 2014-2020, the average altitude is 1603 m, and the average slope of the terrain is 11.1%, which adversely affects the general economic and infrastructural development of the municipality, as well as the development of the settlement network.

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Municipality of Belitsa: has total area of 267,350 decares, or 4.25% of the territory of Blagoevgrad region. Territorial structure includes 25% agricultural territories, 73% forest territories, 1.6% urbanized territories. Soil types are: deluvial soils at the foot of the slopes, in the valleys of the rivers Mesta and Belichka, alluvial deluvial, humus carbonate, brown forest soils, mountain meadows. The presence of erosion processes are common in the deforested areas.

Razlog Municipality: has total area of 440,213 decares, of which - agricultural lands 124,398 decares (arable land 54,618, permanent crops 23,388, others - 46,343), forest areas – 178,637 decares, water areas and watercourses – 4,517 decares, protected territories - 106,518 decares, urbanized territories - 20,758 decares, territories with other purposes - 1,711 decares (including rocks, sands, gullies, screes, ravines, etc.), disturbed terrains – 73,3 decares. Soil types are: in the plain part leached cinnamon forest soils, alluvial meadow and deluvial soils, at the foot of Rila and Rhodopes - shallow eroded cinnamon forest soils, on the slopes of Rila and Pirin brown forest soils and over 2,000 m above the sea level - mountain meadow soils.

Municipality of Bansko: Agricultural lands - 99,151 decares, which is 20.84% of the territory of the municipality (arable lands - 43,960 decares, permanent crops 1,050 decares, meadows 12,500 decares, pastures - 35,120 decares, other agricultural lands - 6,521 decares), forest territories – 361,880 decares, 76.04% of the territory of the municipality. Soil types are: leached cinnamon forest soils (predominant soil type) on the northern slopes of Pirin, deluvial and deluvial meadow soils, brown forest soils over 800 m above the sea level, dark mountain forest soils - over 1800 m above the sea level, mountain meadow underdeveloped shallow soils in the highest parts of Pirin mountain. Highly development of erosion processes of almost all soil types (stream, furrow) in the high parts of the mountain with the exception of mountain meadow peat soils, caused by genetic, relief, anthropogenic reasons.

Municipality of Gotse Delchev: Total area of 333,690 decares, predominant soil type in the flat part of the valley - alluvial-deluvial soils. The southern location, the Mediterranean climatic influence and the presence of a natural water source favor the development of crop production. Disturbed territories are one concession for coal extraction and two concessions for inert construction materials.

Hadzhidimovo Municipality: total area 328,000 decares, of which - agricultural territories 178,400 decares, forest territories 138,000 decares, settlements 7,000 decares, watercourses and water areas 3,400 decares, territories for extraction of minerals - 200 decares, territories for transport and infrastructure 800 decares. Soil types are: cinnamon forest soils (with the predominant share), brown forest and deluvial alluvial soils.

3.2.5.2. SOIL CONTAMINATION WITH HEAVY METALS AND METALLOIDS

The territory of RIEW - Blagoevgrad is covered within a uniform network 16x16 km with 22 permanent points. Diffuse contamination is monitored in these points. The observed indicators are copper, zinc, lead, cadmium, nickel, chromium, cobalt, arsenic, mercury, total nitrogen, total phosphorus, organic carbon, active soil reaction (pH), nitrate nitrogen, total carbon, persistent

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organic pollutants (16 surfactants, 6 polychlorinated biphenyls, 8 organochlorine pollutants), bulk density, moisture content, specific electrical conductivity and particle size distribution.

Every 5 years a monitoring is carried out in all points. The rest of the time an analyses are made in a reduced number of points, according to soil monitoring programs, approved by the Executive Director of the Executive Environment Agency.

For 2017, was performed sampling and monitoring of 5 pcs. samples in permanent points with №№ 65 Mihnevo village, 66 Valkovo village, 82 Dolno Spanchevo village, 99 Goleshevo village, 102 Gostun village, all on the territory of Blagoevgrad region. According to protocols with results for mercury, there is no deviation from the norms, with exception for one sample (point in the Gostun village) where the concentrations are below the limit for quantification of the method. For this exception, the mercury content is also within the limits and also within the background concentrations of -0.03 mg/ kg dry soil.

For 2018, samples of 5 pcs. from permanent checkpoints were monitored - № 101 village of Breznitsa, Gotse Delchev municipality, №104 Cherna Mesta village, Yakoruda municipality, № 117 Gorno Dryanovo village, Garmen municipality, № 103 Chereshovo village, Belitsa municipality and № 132 Beslen, Hadzhidimovo municipality. All the points are located on the territory of Blagoevgrad region. The deadline for overall implementation of the monitoring program was May 15, 2019.

The results of the conducted reduced soil monitoring for 2017, compared to Ordinance № 3 of 1 August 2008 on the norms for permissible content of harmful substances in soils, show the following:

- point № 99 - Goleshovo village, Sandanski municipality - the contents of heavy metals (with the exception of cadmium) are above the background concentrations, but do not exceed the precautionary concentrations;
- point № 102 - the village of Gostun, Bansko municipality - the contents of heavy metals are below the specified background concentrations;
- point № 82 - village of Dolno Spanchevo, Petrich municipality - the contents of heavy metals are below the specified background concentrations
- point № 65 - the village of Mihnevo, Petrich municipality - no excess of precautionary concentrations;
- point № 66 - village of Valkovo, Sandanski municipality - the contents of heavy metals (with the exception of arsenic) are within the background concentrations, the content of the arsenic is below the specified precautionary concentrations.

For 2019, were monitored samples of 6 pcs permanent points - № 48 Zoychene village, Petrich municipality, №51 Simitli, Simitli municipality, № 83 Doleni village, Sandanski municipality, № 86 Belitsa (Gorno Draglishte), Belitsa municipality, № 116 Kopriven village, Hadzhidimovo municipality and №133 Satovcha village, Satovcha municipality. All the points

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are located on the territory of Blagoevgrad region. The deadline for overall implementation of the monitoring program was May 15, 2020.

The results of the reduced soil monitoring for 2018, compared to Ordinance № 3 of 1 August 2008 on the norms for permissible content of harmful substances in soils, in respect of heavy metals and metalloids, show the following:

- point № 132 - the village of Beslen, Hadzhidimovo municipality - the copper contents exceed the background concentrations and are within the norms for precautionary concentrations; chromium contents exceed the norms for precautionary concentrations and maximum permissible concentrations;
- point № 101 - the village of Breznitsa, Gotse Delchev municipality - zinc contents exceed the background and precautionary concentrations, but are below the maximum allowable concentrations. Lead contents exceed the maximum permissible concentrations;
- point № 117 - the village of Gorno Dryanovo, Garmen municipality - the contents of heavy metals are within the background concentrations;
- point № 104 - the village of Cherna Mesta, Yakoruda municipality - the contents of heavy metals are within the background concentrations;
- point № 103 - Chereshovo village, Belitsa municipality - the lead contents exceed the precautionary concentrations and are below the maximum permissible concentrations.

According to the indicators for persistent organic pollutants, the contents are significantly below the reference background values, with small exceptions - less than the limit of quantification of the method.

3.2.5.3. CONTAMINATION OF SOILS WITH PLANT PROTECTION PRODUCTS (PESTICIDES)

By 2019 on the territory of RIEW - Blagoevgrad are no registered cases of pollution of areas as a result of the use of permitted pesticides.

From the conducted monitoring in 22 pcs. points the contents of polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine pesticides are also monitored according to a wide range of indicators.

The analyzes of samples from the approved monitoring points of the National Environmental Monitoring System (NEMS) so far show that there is no excessive content.

Storage of old and obsolete plant protection products.

Table 11 below provides information on the quantities of products stored on the territory of RIEW - Blagoevgrad during the period 2017-2019, as well as the condition of the warehouses.

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Table 11. Warehouses for storage of plant protection products (PPP)

№	Location of warehouses			Condition of warehouses						Quantity of PPP in kg (liter)					
	Settlement	Municipality	Owner	Protected/ Unprotected	Good / Bad	liquidated / relocated during the current year				with known origin		with unknown origin		total kg (liter)	
						in BB cubes		in centralized warehouses							
						number	quantities PPPs	number	quantities PPPs	solid	liquid	solid	liquid	solid	liquid
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Greenhouses MELO	Sandanski	private	unprotected	good							1050	300	1050	300
2	The village of Sklave	Sandanski	unidentified	unprotected											
3	Katuntsi village	Sandanski	private	unprotected	good							380	1450	380	1450
4	Petrovo village / private yard /	Sandanski	private	unprotected	good							1400		1400	
5	The village of Harsovo- farmyard	Sandanski	private	unprotected	good							2550	120	2550	120
6	The village of Ploski	Sandanski	unknown	unprotected	good							-	420	-	-
7	town of Petrich / in the Greenhouses/	Petrich	private	protected	good							10000	5000	10000	5000

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8	town of Razlog	Razlog	cooperative	unprotected	good							2316	2055	2316	2055
9	The village of Banya	Razlog	municipal	unprotected	good							2600 + 1000 / soil /	300	2600 + 1000	300
10	The village of Banichan	Gotse Delchev	municipal	unprotected	good							2000	100	2000	100
11	Razdol village	Stumyani	municipal	unprotected	good							1800	200	1800	200
												25 096	9 945	25 096	9 945

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Table 12. BB cubes and quantities of PPP (available on the territory of RIEW until 2019)

№	Location of BB cubes		Quantity of PPP in kg (liter)
	Settlement	Municipality	
1	Bansko	Bansko	8000
2	Blagoevgrad	Blagoevgrad	48000
3	Hadzhidimovo	Hadzhidimovo	4000
4	Goreme	Strumyani	4000

In 2018 and 2019 the pledged warehouses for storage of old plant protection products with higher risk for the environment were inspected, respectively - in the village of Razdol, Strumyani municipality, Ploski village, the area of MELO greenhouses, Sklave village, Harsovovillage, Katuntsi village and Petrovo village, all on the territory of Sandanski municipality. The warehouse in the town of Petrich in the area of Petrich greenhouses was also inspected. No emergency situations and warehouses in poor condition were observed.

In 2018, inspections were carried out at two sites with BB cubes located in the land of town of Bansko and town of Hadzhidimovo. No irregularities were found. In 2019, two sites with BB cubes were inspected - Bansko and Blagoevgrad. For the second site was found irregularities in one of the containers, withno detected contamination. According to the prescription given by RIEW, actions have been taken by the municipality to eliminate the damage.

A lasting solution to the issue of the available quantities of old obsolete plant protection products is expected with the successful implementation within the current year of the project - **"Environmentally friendly disposal of unusable pesticides and other plant protection products"** managed by the Enterprise for Management of Conservation Activities of Environmental Protection (EMEPA) to the Ministry of Environment and Water, on the basis of a signed on 07.09.2010Framework Agreement between the Government of the Republic of Bulgaria and the Federal Council of the Swiss Confederation, on the implementation of the Bulgarian-Swiss Cooperation Program.

3.2.5.4. SOIL POLLUTION WITH PERSISTENT ORGANIC POLLUTANTS, INCL. PETROLEUM PRODUCTS

Until 2019, there are no cases of exceeding the norms for persistent organic pollutants and oil products from the conducted monitoring in permanent monitoring points of National System for Environmental Monitoring (NSEM).

The results show values below the specified background values or close to them, according to Ordinance № 3 of 1 August 2008 on the norms for permissible content of harmful substances in soils.

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3.2.5.5. SOIL EROSION

The data from EEA shows that the information was analyzed by the affected types of areas (arable land, uncultivated land, pastures, forest areas) and by municipalities, on the territory controlled by the RIEW - Blagoevgrad. The data is summarized on the basis of averaged data from the hydro-meteorological stations in Blagoevgrad and Sandanski for 2016 and calculations based on a GIS model. The classification of the territories corresponds to the nomenclature of “Corine land cover 2012” whose database was used by EEA.

For all municipalities within the scope of RIEW-Blagoevgrad, the risk of water erosion was calculated as weak and very weak for all type of areas. The calculations are based on data from 2016.

Table 13. Types of areas affected by water erosion (in ha)

Municipality	Arable agricultural land		Uncultivated agricultural land		Pastures		Forest areas	
	Very weak	Weak	Very weak	Weak	Very weak	Weak	Very weak	Weak
Bansko		5290.4				219.85		18301.54
Belitsa		490.26				174.25		157630.62
Blagoevgrad		3993.86		614.41		3022.15		36670.27
Gotse Delchev	661,81	3973.09	69.21		780.8	52.76	61761.37	20445.11
Garmen	2533.6	2958.02		101.49	73.94	538.07		150984.25
Kresna	785,69	261.24	177.55		57.91	260.55	40084.76	56819.82
Petrich	5726.78		2103.6		2548.57		28108.29	
Razlog		6758.43				1872.1		202419.12
Sandanski	5969.46		3211.57		2915.04		98214.23	
Simitli		171.9		86.3		877.2		72452.11
Strumyani	1876.26		321.77				59084.04	6109.61
Hadzhidimovo	5882.66		82.26		196.22	104.48	21380.07	5032.22
Yakoruda		48.55				203.28		162994.6

3.2.5.6. SALINIZATION AND ACIDIFICATION OF SOILS

Acidification, nature of soil acidity - manifests itself in the process of weathering of primary minerals and is associated with their hydration and leaching of the released from the composition of the crystal lattice alkaline earth and alkaline cation

Since 2016, the observed points for harmful soil acidity for plants are Satovcha, Razlog and

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Kavrakirovo (Petrich municipality). The same points are representative of the typical soil types in the region. Since 2017, RL-Smolyan and RIEW-Smolyan are responsible for Satovcha point.

The results of the conducted survey in 2018 show the following: the pH values (KCI) for Kavrakirovo point are in the range from 5.78 to 7.14, neutral to slightly alkaline reaction of the soils. The pH values (KCI) for Razlog point are from 4.55 to 4.89, i.e. medium acid reaction, but the content of bases (calcium and magnesium ions) are higher and the coefficient V% (saturation with bases) is high - 98% - there is no need for liming - from 5.05 to 5.46, i.e. slightly acid reaction.

The results of the conducted survey in 2019 show the following: the pH values (KCI) for Kavrakirovo point are in the range from 4.78 to 5.59, neutral to slightly alkaline reaction of the soils. The pH values (KCI) for Razlog point are from 4.55 to 5.33, i.e. medium acid reaction, but the content of bases (calcium and magnesium ions) are higher and the coefficient V% (saturation with bases) is high - 98% - there is no need for liming. from 5.05 to 5.46, ie slightly acid reaction.

Methods for removing harmful acidity in the soil and for limiting the toxic effect of acid soils on cultivated plants:

Agrotechnological methods, including: 1. Selection of sustainable species and varieties of cultivated plants in crop rotation. 2. Regulation of the water-physical properties of the soil. 3. Balanced mineral nutrition. 4. Organic fertilization and green fertilization.

Agrochemical methods, including: 1. Liming of soils with harmful acidity. 2. Phosphorization. 3. Silicification. 4. Plastering.

Chemical ameliorants for liming acid soils, including: 1. Hard limestone rocks and dolomites. 2. Chalk. 3. Roasted and slaked lime. 4. Lime ash. 5. Slag from metallurgical productions. 6. Saturn lime.

3.2.5.7. UNREGULATED WASTE DISPOSAL ON THE SOIL SURFACE (CONSTRUCTION, DOMESTIC, INDUSTRIAL AND AGRICULTURAL WASTE)

There is carried out systematic control for the fulfillment of the obligations of the mayors of municipalities, arising from the Waste Management Act, regarding the illegal disposal of waste in unauthorized places, the formation of illegal dumps/pollution, their cleaning, as well as taking precaution measures to prevent or limit their occurrence.

3.2.6. ANALYSIS OF THE IMPACTS FROM THE FACTORS

3.2.6.1. WASTE

The obligations of the local self-government bodies and the local administration include the organization of environmentally friendly management of the domestic and construction waste generated in the respective administrative-territorial unit. In this regard, the mayor of the

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municipality develops and implements a Waste management program (according to Article 52, paragraph 1 of the WMA). It is an integral part of the municipal environmental program and its period of action coincides with the period of action of the National Waste Management Plan 2014-2020. In 2017, 8 municipal waste management programs were updated, in 2018 - 2 programs, and in 2019 no updates of municipal programs were made. Until 31-st of March each year, the mayor of the municipality reports to the municipal council for his actions for waste management program implementation. The mayors, included in regional associations such as Regional System for Waste Management (RSWM)-Razlog for the municipalities of Razlog, Bansko, Belitsa and Yakoruda 2016-2020, RSWM-Gotse Delchev for the municipalities of Gotse Delchev, Garmen and Hadzhidimovo 2014-2020, have developed common waste management programs, where the obligations, responsibilities and measures affecting the individual municipalities are clearly distinguished. At the moment, all municipalities have adopted regulations applicable to waste management.

At this stage in the municipalities falling within the scope of RIEW-Blagoevgrad, still are not constructed sites for free transfer of separately collected waste from households, incl. bulky waste, hazardous waste and others in settlements with a population of more than 10,000 inhabitants, as required by Art. 19, para. 3, item 11 of the WMA.

As a result of the inspections carried out in 2019, it can be summarized that the persons placing on the market widespread waste fulfill their obligations by participating in collective systems represented by organizations for utilization of waste or paying the due product fee to the EMEPA. On the territory of RIEW-Blagoevgrad there are no persons who perform their duties individually.

Separate waste collection

The municipalities are obliged to organize separate collection of waste from packaging for settlements with more than 5,000 inhabitants according to the requirements of the WMA and the Ordinance on packaging and waste from packaging. This requirement is met for all municipalities in Blagoevgrad region. Based on the inspections carried out in 2019 on the implementation of the system for separate collection of waste from packaging, the information by municipalities is as follows: Bansko municipality (90.5% of the population is covered by separate collection systems), Belitsa municipality (7%), Blagoevgrad municipality (91.96%), Gotse Delchev municipality (92.5%), Gurmen municipality (60%), Kresna municipality (77.5%), Petrich municipality (62.4%), Razlog municipality (88%), Sandanski municipality (89.7%), Simitli municipality (83.4%), Strumyani municipality (73.1%), Hadzhidimovo municipality (59%), Yakoruda municipality (70%) .

Domestic waste

The system for organized waste collection and transportation covers about 99% of the population in the territory controlled by RIEW-Blagoevgrad. The transportation of the domestic waste is carried out to regional landfills for non-hazardous waste, operating on the territory of RIEW-Blagoevgrad. Blagoevgrad municipality delivers domestic waste for pre-treatment activities before deposition at Regional Landfill for Non-hazardous Waste (RLNW)-Kostinbrod. In

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the settlements with small population and / or difficult to access geographical location (mountainous areas), typical for the municipalities of Sandanski, Strumyani, Petrich, Simitli, it is difficult to carry out organized waste disposal activities. For those settlements the collection and transportation of waste is carried out by the request of the respective mayor or deputy mayor.

On the territory of RIEW Blagoevgrad are located the following landfills: Regional landfill for non-hazardous and inert waste for the municipality of Petrich; RLNW for the municipality of Gotse Delchev, Hadzhidimovo, Garmen; RLNW for the municipalities of Sandanski, Strumyani and Kresna; RLNW for the municipalities of Razlog, Bansko, Belitsa, Yakoruda and Regional landfill - Blagoevgrad, providing services to the municipalities of Blagoevgrad, Simitli, Rila, Kocherinovo and Boboshevo. The described systems meet the regulatory requirements and have a IPPC permit. In 2019, a Useage Permit with № DK-07-BI-99 / 29.08.2019 was issued to the “Regional Waste Management System (RWMS), Blagoevgrad Region, covering the municipalities: Blagoevgrad, Simitli, Rila, Kocherinovo and Boboshevo - Stage I”, including Cell № 1.

In 2019 on the territory of RIEW - Blagoevgrad still are not constructed facilities for construction waste treatment. Currently, only on the territory of RLNW-Razlog is available and in operation composting facility for biodegradable waste.

Construction waste:

In Blagoevgrad region as a weak point can be mentioned the lack of installations and facilities for treatment of construction waste which continues in 2019 as well. The generated construction waste is mainly handed over for disposal to landfills for inert waste or to the RLNW. Practice shows that separate collection by type of construction waste is almost not carried out, neither from the companies nor by the population. Only metal waste generated by construction activities is 100% recovered.

Main unsolved problems with hazardous waste (domestic and industrial) on the territory of RIEW.

There is no center and / or facility for hazardous waste disposal on the territory of RIEW-Blagoevgrad. The companies face difficulties in handing over those waste for further treatment, as the generated quantities are small, the persons entitled to treat such waste are situated in remote parts of the country, which leads to a higher cost of the service. This contributes to their storage at the place of generation for a longer period of time, which is contrary to legal requirements.

The municipalities have not taken concrete and effective actions in connection with the regulations governing the treatment and transportation of widespread waste - waste oil and waste petroleum products, accumulators, batteries, fluorescent lamps and others. The practice of conducting annual campaigns together with recovery organizations is accepted. On the territory of RIEW-Blagoevgrad there are no sites for gratuitous transfer of separately collected waste from households, incl. bulky waste, hazardous waste and others in settlements with a population of more than 10,000 inhabitants. Waste should be transferred directly to the sites without wasting time and seeking a solution, or to be disposed of in the environment or treated

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in ways that lead to environmental pollution in violation of the legislation.

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3.3. SMOLYAN REGION

3.3.1. TERRITORIAL SCOPE

According to data from the Regional Report of the Environmental conditions for 2019 issued by RIEW Smolyan, Smolyan region is located in Southern Bulgaria in the central part of the Rhodopes on a territory of 3,192.9 km² (2.9% of the country's territory). It borders the region of Plovdiv, Pazardzhik, Kardzhali and Blagoevgrad (Fig. 12), and to the south the regional border coincides with the state border with the Greece Republic. Administratively, the region is divided into 10 municipalities, 103 town halls and 242 settlements.

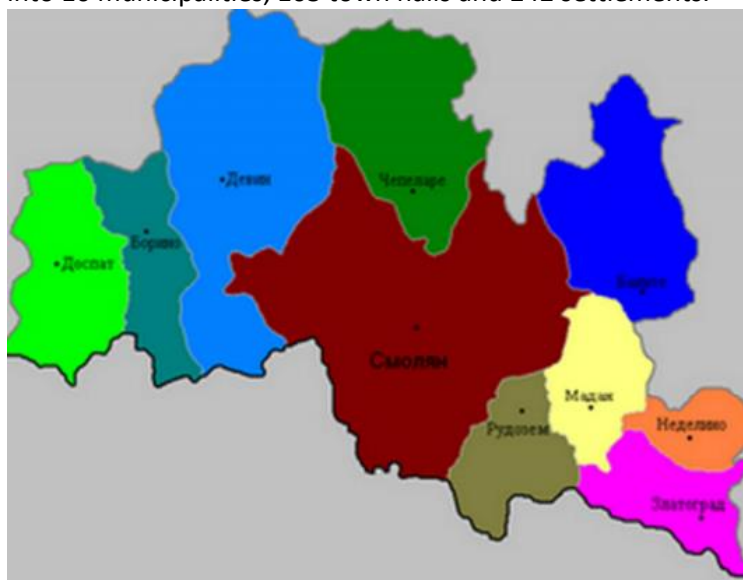


Figure 12. Regional map of Smolyan district

Physico-geographical and economic characteristics:

Smolyan region is characterized by preserved clean environment, which is one of the specific advantages, other is the presence of natural resources - ore, mineral water, forest areas. Forests cover a large part of the territory - 2,093 thousand decares (66%), and agricultural lands occupy 851 thousand decares (27%). Forest vegetation is represented by deciduous forests - in the lower parts and coniferous forests in the high parts.

The territory of the region is characterized by mountainous terrain, which impacts on the overall socio-economic, settlement and infrastructural development. The average altitude of the region is within the range of 450 to 2,191 m.

Due to the specific natural conditions, road transport is the only type of transport in Smolyan region. The transport services of the population are carried out entirely by private companies. The municipal and regional transport schemes fully meet the needs of the population. Smolyan region has direct transport connections with the cities of Plovdiv, Kardzhali, Haskovo and

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Pazardzhik. There is a relatively well-developed road network in Smolyan region. The total length of the roads is 1,256 km. The national road network includes 606 km of roads and the municipal road network is 650 km.

The most important conclusions for Smolyan region are as follows:

- The only area that does not have access to a railway network.
- There is no direct access to ports and airports in the region.
- 100% of the population is served by road transport, in mountain conditions.
- Insufficient number of border crossings.
- Poor condition of available transport roads.

3.3.2. ANALYSIS OF THE MAIN COMPONENTS OF THE ENVIRONMENT

3.3.2.1. CLIMATE AND AMBIENT AIR

The territory of Smolyan region covers a belt with a predominantly mountainous climate, which in the southeastern parts of the region is transitional Mediterranean. It is characterized by mild and snowy winters and cool summers. By municipalities, the climatic manifestations are as follows:

Banite Municipality falls in an area with a transitional - Mediterranean climate, as well as in a transitional in altitude of the area- low, medium and high mountain version (altitude 450 m above the sea level in the Arda river valley - 2001 m at Prespa peak).

Borino Municipality is characterized by a temperate continental to transitional continental climate (altitude 1000-1600 m above the sea level).

Devin Municipality falls in an area with a transitional - continental climate (altitude from 420 m below the level of the dam "Vacha" to 2091 m on the peak "Golyam Persenk").

Dospat Municipality is characterized by a transitional-continental climate (average altitude 1000m), with a slight Mediterranean influence, with an average annual temperature of 8.1°C. The winters are mild and the summers are cool. The precipitation (976 mm - rain and snow) is above the average for the country. The maximum snow cover is 105 cm and lasts from 80 to 120 days.

Zlatograd Municipality falls in an area with a continental-Mediterranean climate (altitude 385-1118 m).

Madan Municipality falls in the continental-Mediterranean region (average altitude about 700 m), the southern Bulgarian climatic subregion, eastern Rhodope and low climatic region, and the parts above 1000 m above the sea level in a mountainous climatic region.

Nedelino Municipality falls in an area with a transitional-continental climate (average altitude 700 m), and in the southeastern parts the climate is transitional-Mediterranean.

Rudozem Municipality is characterized by a temperate-continental climate (average altitude 700-800 m).

Smolyan Municipality falls in an area with a transitional-continental climate (average altitude about 1230 m), with a slight Mediterranean influence.

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Chepelare Municipality falls within the range of the mountain climate region according to the altitude (1000 - 1600 m), to the European - continental climate area and to the transitional - continental subregion.

3.3.2.2. AMBIENT AIR QUALITY

During the period 2017-2019 there is a tendency for reduction of PM₁₀ pollution in Smolyan region. According to the data from the 365 measurements conducted in 2017, 84pcs. (27% of all analyses) exceed the threshold values of the average daily norm (TV of the ADN) for PM₁₀., and the exceedances by months are as follows: in January - 25 pcs.; February - 21 pcs.; March - 10 pcs.; April - 2 pcs. ; May - 1 pcs; November - 15 pcs. and December - 10 pcs. The analyses of results for 2017 show that the exceedance values for PM₁₀ are in winter months, and for the months - January, February, November and December was measured monthly concentration above 50 µg/m³.

Over the next two years (2018 and 2019) is observed slight decrease in the number of measurements exceeding the TV of the ADN. In 2018, were performed 312 measurements of PM₁₀, of which the exceedances values were 57pcs (18%) of all measurements. The exceedances by months are as follows: January - 17pcs.; February - 8 pcs.; March - 2 pcs.; April - 1 pcs.; October - 2 pcs.; November - 9 pcs. and December - 18 pcs.. The analyses of results for 2018 show that the exceedance values for PM₁₀ are in winter months, and for the months - January and December was measured monthly concentration above 50 µg/m³.

In 2019, were performed 334 measurements of PM₁₀, of which the exceedances values were 56pcs (17%) of all measurements. The exceedances by months are as follows: January - 19pcs.; February - 12 pcs.; March - 5 pcs.; April - 4 pcs.; October - 2 pcs.; November - 4 pcs. and December - 10 pcs.. The analyses of results for 2019 show that the exceedance values for PM₁₀ are in winter months, and for the months - January, February and December was measured monthly concentration above 50 µg/m³. The higher values in the winter months for all three years increase not only the average annual concentration of PM₁₀ but also the admicable number of exceedances per calendar year. The reason for the significant number of exceedances during the winter season are the geographical location of the city, the specific meteorological conditions (low wind speed, presence of inversions, etc.) and impossibility to disperse the atmospheric pollutants

Figure 13 below shows the average monthly values of pollutant PM₁₀ for AMS - Smolyan for the period 2012-2019.

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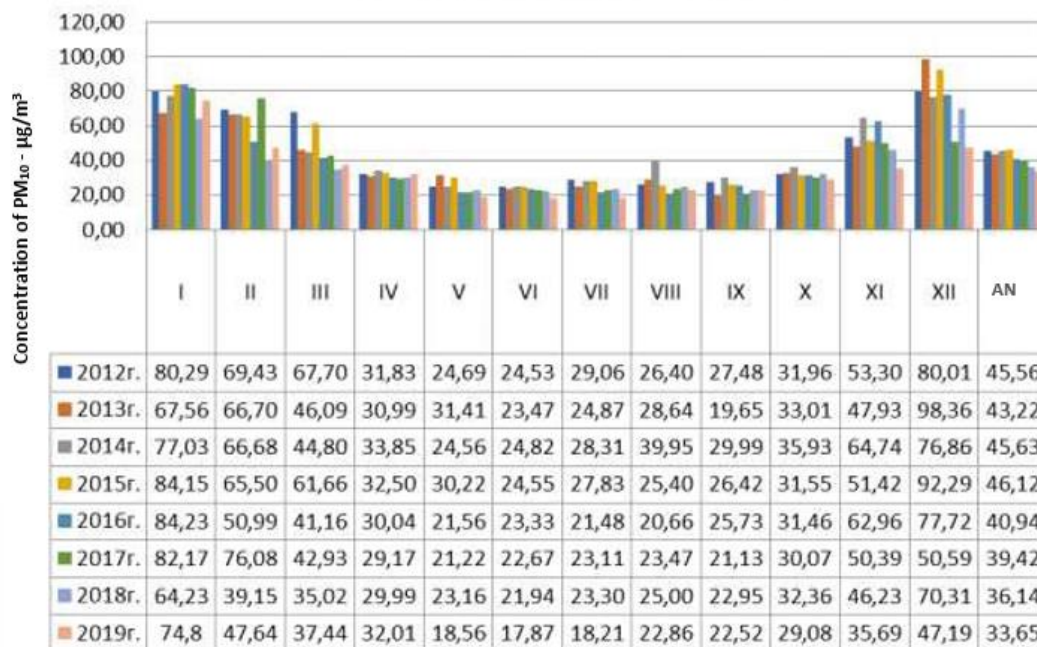


Figure13. Average monthly values of pollutant PM10 for AMS - Smolyan for the period 2012-2019.

The average annual value of PM₁₀ measured by AMS "Smolyan" for the town of Smolyan for 2017 is 39.42 µg/m³, for 2018 - 36.14 µg/m³, for 2019 - 33.65 µg/m³, where the AAN is 40 µg/m³, which indicates that there are no exceedances for this pollutant. The main PM₁₀ polluter is domestic heating, intensive transport and unsupported road and adjacent infrastructure.

The maximum values of CBS Rozhen in the winter season are reported from 1 to 3 days later than the AMS Smolyan measurements. In the summer the tendency is that the high values are measured at CBS Rozhen, and then at AMS Smolyan, which leads to the conclusion that the transmission is from the interior parts of the country.

With Decision № 860 / 18.12.2014 of the Municipal Council - Smolyan, were adopted a Program for reduction of PM₁₀ pollution on the territory of the Municipality of Smolyan and Action Plan with a period of validity 2015-2020. In 2016, with Decision № 183 / 12.05.2016 of the Municipal Council - Smolyan, the update of the Program for reduction of pollution with fine dust particles (PM₁₀) and Action Plan 2015-2016 was adopted.

3.3.2.3. SOURCES OF EMISSIONS INTO THE AIR

On the territory of RIEW Smolyan, where Smolyan region is located, are operating 345 installations with over 3 kg of freon and/or with over 5 t/CO₂ eq. In 2017, were inspected installations in 29 sites, in 2018 - 39 sites, and in 2019 - 37 sites. No violations were found during the inspections and no acts were drawn up, except for one in 2019, related to non-submission of the annual report on quantities used freon, when at the company was issued an AEAV and an PD was issued.

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The main signals for air pollutants in the region are from the operation of industrial fuel sources below 0.5 MW, which are not normed. The main industrial pollutants on the territory of the inspection are the asphalt bases, the mills to the ore concentrators, the dryers to the wood processing enterprises. When it is performed emission control of the polluting sites in the region and exceedances of the norms for admissible emissions are registered, administrative penalty measures shall be taken.

3.3.3. WATER

3.3.3.1. SURFACE WATER PROTECTION

During the period 2017 - 2019 was conducted emission control of sites generating wastewater and discharging into surface water bodies, tributaries of the rivers Arda, Maritsa and Mesta, passing through the territory controlled by the RIEW - Smolyan. The territory of the region, which is within the scope of control of the RIEW, falls into two basin directorates: East Aegean Basin Directorate with center the town of Plovdiv (municipalities Smolyan, Banite, Borino, Devin, Zlatograd, Madan, Nedelino, Rudozem, Chepelare) and West Aegean Basin Directorate with center the town of Blagoevgrad (Dospat municipality).

3.3.3.2. SURFACE WATER MONITORIN

When the network for control monitoring of surface waters on the territory of the EADB, was created, a representative monitoring points have been selected for the respective river basins and the types of water bodies. During the period 2017 and 2019 on the territory of Smolyan region was conducted monitoring of rivers in three points (Arda river - Mogilitsa village; Arda river - before the town of Rudozem; Arda river near Vehtino village) and in 2018 - in four points (Arda river - Mogilitsa village; Arda river - before the town of Rudozem; Arda river near the village of Vehtino; Vacha river near the town of Devin).

In order to determine the ecological and chemical status of surface water bodies in these points, monitoring of biological and physico-chemical elements is carried out, and according to RBMP once for the period it is planned to be monitored hydromorphological quality elements.

During the preparation of the program for operational monitoring of surface waters in the EADB was used information on the status of the designated water bodies. Operational monitoring points are placed in those water bodies that are in poor condition and there is a risk that they will not achieve good condition. In 2017, 19 points were set for operational monitoring (17 pcs on rivers and 2 pcs on dams), in 2018, 19 points were set (18 pcs on rivers and 1 pcs on dams). In 2019 on the territory of RIEW - Smolyan 16 points for operational monitoring have been determined - 15 pcs on rivers and 1 pcs on dam (Water Monitoring Program under Order No. RD-230/28.03.2019 of the Minister of Environment and Water). These points are monitored for biological and physico-chemical quality elements.

The chemical condition of surface water bodies is assessed in two classes – “good” and “bad”, which are depicted in blue and red colours, respectively. To perform a reliable assessment,

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it is necessary that the minimum frequency of analysis should be 12 times a year (once a month). These water bodies, which meet the average annual values of the environmental quality standards (AAV-EQS), are in “good condition”, and for the water bodies in which the AAV-EQS is exceeded, is determined that they are in “poor condition”. For the water bodies where priority substances are not monitored, due to the lack of identified pressures, the chemical status is defined as "unknown". In 2019, 30 surface water bodies in Smolyan region were monitored for the presence of priority substances. In three water bodies - "Manastirska River and Dzhurkovska River to the Belishka River", "Madanska river" and "Source of the Varbitsa River near the town of Zlatograd" the EQS exceeded the indicators for cadmium, lead and nickel, which determines their poor chemical conditions.

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Table 14. Number of surface water bodies by chemical status in 2019

	Water Bodies	Arda	Maritsa	Mesta	Total
Chemical condition	Good	17	10	6	33
	Bad	2	1	0	3
	Unknown	3	5	6	14
	Total WB	22	16	12	50

The assessment of the ecological status/ potential of surface water bodies is performed according to the classification system for biological and physico-chemical quality elements, and environmental quality standards for chemical elements and specific pollutants, included in Ordinance № H-4 of 14.09.2012 for characterization of surface waters.

The results from analysis of the assessment of the ecological status / potential of surface water bodies on the territory of RIEW - Smolyan by river basins shows that in 2019 the water bodies in “good” condition are 17 and in “moderate condition” - 21. For 2018, it could be seen a slight improvement of the ecological status/potential (in 2018 - 14 water bodies are in “good” ecological status, 23 in “moderate” and 1 water body in “poor” ecological status/potential). When comparing the results with those in 2017, there is no improvement in the ecological status/potential (in 2017, 13 water bodies are in “good” ecological status, 24 in “moderate” and 1 water body in “poor” ecological status/potential). The main physico-chemical indicators on which deviations are observed are related to organic pollution, caused of which is untreated wastewater from settlements, discharge of untreated water from mine and industrial wastewater (orophosphates, total phosphorus, ammonium nitrogen, nitrite nitrogen, nitrate nitrogen, total nitrogen and BOD).

On the territory of Smolyan region are situated 24 water intakes for drinking water supply from surface waters, located in 9 drinking water bodies. The results of determining the category of water sources and the condition of surface drinking water bodies according to data from the monitoring conducted in 2019 show that the condition of all drinking water bodies and water sources is defined as good (category A1 and A2).

3.3.3.3. SOURCES OF WASTEWATER AND CONDITION OF TREATMENT FACILITIES

The main pollutants of the water bodies on the territory controlled by RIEW - Smolyan are the waste water from the sewerage systems of the settlements and the industrial waste water from the industrial sites, located outside the regulation borders of the settlements. Most of the

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agglomerations, with a population under 2000 eq. inhabitants and from 2000 to 10 000 eq. inhabitants, do not have constructed or have partially constructed sewerage networks and wastewater is discharged into absorption facilities or adjacent gully and rivers.

In the sewerage networks of the agglomerations (where the networks are constructed), is discharged not only the domestic wastewater, but also industrial wastewater from the industrial plants operating on the territory of the agglomerations. For the discharge of wastewater from the sewerage networks in surface water bodies, as well as for the discharge of wastewater after city waste water treatment plants have been issued permits for discharge of wastewater into water bodies by the respective basin directorates.

On the territory of the RIEW have been constructed and put in operation waste water treatment plants in the following settlements:

- 1 WWTP for over 10,000 eq. inhabitants - town of Smolyan;
- 4 WWTP for 2,000 to 10,000 eq. inhabitants - town of Madan, town of Zlatograd, town of Rudozem and Pamporovo resort;
- 15 WWTP for population under 2,000 eq. inhabitants - the villages of Trigrad, Grohotno and Selcha
- 2 WWTP in Devin municipality, villages Osina, Vaklinovo, Zhizhevo, Fargovo, Dolen, Bogolin, Tuhovishta, Kribul, Godeshevo village in Satovcha municipality, Progled village in Chepelare municipality and village of Oryahovets in the municipality of Banite.

The settlements with 2000 to 10 000 eq. Inhabitants - Devin, Dospat, Borino, Chepelare, Ardino, Satovcha, Lucky, Nedelino and Banite doesn't have constructed WWTPs, and wastewater is discharged untreated into water bodies, thus maintaining the pressure (pollution) on them in the river valleys of Arda, Maritsa and Mesta.

The town waste water treatment plants of Smolyan, Madan, Rudozem and Zlatograd are modern facilities built 10-12 years ago. Their technological schemes include facilities for mechanical and biological treatment, treatment of sludge and facilities for decontamination of treated wastewater if necessary. The condition of the facilities is good. The results of the emission control and self-monitoring of WWTPs in 2019 show effective work with a very good treatment effect and no exceedances of the individual emission limits (IEE) according to the discharge permits have been established.

For WWTP-Smolyan it is planned, at the start of the "Second water cycle of Smolyan", to be realized the second stage - construction of facilities for treatment of nitrogen and phosphorus.

In 2019, were performed 41 pcs. scheduled and 8 pcs. unscheduled inspections, and they are related to subsequent control over the implementation of the given prescriptions.

Sites, sources of industrial wastewater, with constructed WWTP and treatment facilities

According to assignment of the National System for Monitoring of the Environment (NSME) is conducted emission control on sites generating wastewater, which are discharged into surface water bodies, included in the "Information system for permits and monitoring in water

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management". in 2019, 36 sites subject of mandatory monitoring were inspected according to the approved list with Order № RD-788 / 20.12.2018 of the Minister of Environment and Water, including:

- "P.A.L-BG" EOOD Sofia - workshop for fish processing in "Staykovska livada" locality, land of Beden village / Devin on the river Shirokolashka, along the river Maritsa. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- ET "ALADA - M. Banashak" Byal izvor village, Milk processing plant (MPP) "ALADA" - production of dairy products, land of Byal Izvor village/ Ardino, Beliiizvorska River, Arda River Basin. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- "Perperikona" OOD, Byal Izvor village, MMP "Rodopchanka" - dairy, land. of Byal Izvor village / Ardino, Beliiizvorska River, Arda River Basin. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- "Rozhen Milk" OOD, Galabovo village, Davitkovo MPP - Davitkovo village / Banite, Davitkovska river, Arda river valley. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- "Scorpion - 21" Ltd., Plovdiv, MPP "Zabardo" - Zabardo village / Chepelare, river Zabardovska, valley of the river Maritsa. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- "Persenski" OOD., Zhaltusha village, MPP "Zhaltusha" - village of Zhaltusha / Ardino, Enyovsko dere, valley of the river Arda. The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- ET "NIK - 60 Nedyalko Kolaksazov" Plovdiv, Fish Processing Workshop "Sinite Hancheta", Hvoyna village/ Chepelare, Chepelarska River, Maritsa River Valley; The site is included in the list for mandatory monitoring for the period 2018 - 2019.
- "ANMAR" OOD., village of Padina, MPP "St. Elijah" village of Padina, village of Padina / Ardino, river Uvadhik, valley of the river Arda; The site is included in the list for mandatory monitoring for the period 2017 - 2019.
- "Laktena" OOD, village of Kutela, MPP-village of Kutela, village of Kutela / Smolyan, gully, Arda river valley. The site is included in the list for mandatory monitoring for the period 2017 and 2019.

in 2019, 36 site (emitters) discharging into surface water bodies were inspected. The sites are included in the "Information system for permits and monitoring in water management" according to the approved list for mandatory monitoring approved with Order № RD-788 / 20.12.2018 of the Minister of Environment and Water. There were taken 55 water samples from wastewater and 327 physico-chemical analyzes on 22 indicators were performed from RL-Smolyan, RL-Plovdiv, RL-Haskovo and RL-Stara Zagora to the EEA-Sofia. 3 AEAV and 3 NPs have been issued based on the performed laboratory analyzes and the established exceeded values of the individual emission limits under the requirements of discharge permits and Annex № 3 of

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Ordinance № 6/2000.

Sites with constructed WWTPs

In 2019, monitoring of 43 installations with local wastewater treatment facilities, discharges into surface water bodies, with issued permits for discharges or discharges into sewerage networks of the settlements was performed.

- “Laktena” OOD- Kutela village, MPP Kutela
- ET "ALADA-Mohamed Banashak" - Byal Izvor village, MPP ALADA
- “Perperikona” OOD - Byal Izvor village, MPP Perperikona
- "ANMAR" OOD - Padina village, MPP "St. Elijah"
- "Persenski" OOD - Zhaltusha village, MPP "Zhaltusha"
- "Cardu" EOOD - Varbina village, MPP "Varbina"
- "Scorpion-21" OOD - city of Plovdiv, MPP "Zabardo"
- ET "Nik-60-Nedyalko Kolaksazov" - city of Plovdiv, Fish Processing Workshop "Sinite Hancheta" Hvoyna
- “P.A.L-BG” EOOD-Sofia, Fish processing workshop in the village of Beden,
- TPK "Mihalkovo" Mihalkovo village, enterprise for bottling of carbonated mineral water in the village of Mihalkovo,
- "Radopska Salzitsa" EOOD, MPP "Radopska Salzitsa"

There been conductor 66 planned and 12 unplanned inspections, including 4 pcs. Inspections under the requirements of IPPC permits. The results of the conducted in 2019 own-monitoring show that the operators with issued IPPC permit and discharge permits comply with the conditions set in the permits.

Sites that do not have a WWTP

In 2019, the RIEW - Smolyan carried out monitoring of economic plants without treatment facilities, 9 inspections of discharges into water bodies through the municipal sewerage systems.

The greatest pressure on the water bodies is exerted by the discharge of untreated wastewater from the sewerage networks of the settlements without constructed treatment plants.

Business entities with activity forming biodegradable industrial wastewater

On the territory of RIEW-Smolyan are constructed and put in operation 28 sites, generating biodegradable industrial wastewater. In 2019 were carried out 12 inspections on sites in the field of food industry - milk processing and dairy production, fish processing, processing and canning of vegetables and processing of wild growing fruits.

Table 15. The sites with biodegradable industrial wastewater and the performed inspections in 2019.

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№	Name of the company performing business activity	Name of the site, settlement, activity	inspections, pcs.			Permits issued
			scheduled inspections	Scheduled inspections	extraordinary inspections	Under the Water Act
the Arda valley						
1	"Laktena" OOD, village of Kutela, municipality of Smolyan	MPP "Kutela", village of Kutela, municipality of Smolyan	2	2		№33720020 / 25.05.2010
2	"Cardu" EOOD, village of Varbina, municipality of Madan	MPP "Varbina", village of Varbina, municipality of Madan	1	1		discharge in KK-Varbina
3	"Rozhen Milk" OOD, Davidkovo village, Banite municipality	MPP "Davidkovo", Davidkovo village, Banite municipality,	2	2		№ 33140164 / 11.04.2006
4	ET "Alada Mohamed Banashak", Byal Izvor village, municipality of Ardino	MPP "Alada", village of Byal Izvor, municipality of Ardino	2	2		№33140084 / 30.07.2010
5	"Perperikona" Ltd., village of Byal Izvor, municipality of Ardino	MPP "Rodopchanka", village of Byal Izvor, municipality of Ardino	2	2	1	№33140231 / 29.09.2017
6	"Anmar" OOD, village of Padina, municipality of Ardino	MPP "St. Elijah", village of Padina, municipality of Ardino	2	2		№33140221 / 20.03.2017
7	"Persenski"OOD, village of Zhaltusha, municipality of Ardino	MPP "Zhaltusha", village of Zhaltusha, municipality of Ardino	2	2	1	№33740038 / 15.06.2009
Maritsa valley						
8	"Scorpion-21" OOD, city of Plovdiv	MPP "Zabardo", village of Zabardo, municipality of Chepelare	2	2		P3№33140095 / 28.03.2011
9	ET "Nik-60-Nedyalko Kolaksazov", city of Plovdiv	Fish processing workshop, Hvoyna village, Chepelare municipality	2	2		P3 № 33140162 / 25.09.2003
10	"P.A.L-BG" EOOD, Sofia	Fish processing shop, land of Beden village, Devin municipality	2	2	1	P3№33140149 / 17.07.2013
11	"Julian Isakov " EOOD, village of Trigrad, municipality of Devin	MPP "Trigrad", Trigrad village, Devin municipality	2	2		P3№33120019 / 06.04.2009

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№	Name of the company performing business activity	Name of the site, settlement, activity	inspections, pcs.			Permits issued
			scheduled inspections	Scheduled inspections	extraordinary inspections	Under the Water Act
12	"Radopska Salzitsa" EOOD	MPP "Radopska Salzitsa"	1	1		discharge into sewers
	Total number of inspections:		22	22	3	

During 2019, 22 pcs. planned and 3pcs. unplanned inspections were performed, regarding the subsequent control of certain prescriptions, complaints and signals.

In the dairy sector, the problem of spent whey remains, which is also emerging as a national problem, especially in the summer months, when large dairies process more than 15 tonnes of raw milk per day. The introduction of new technologies and modernization of the existing treatment facilities continues, but nevertheless some sites failed to reach the norms of the discharge permits, for which administrative and punitive measures were taken.

During 2019, continues the steady improvement of the ecological condition of the Belizvorska River. During the year one signal was received for pollution of the river from the activity of the dairies in the region. The on-site inspection did not reveal any pollution of the river, and no industrial source of pollution was identified. During the year, was received another signal for pollution of Uvadjik Dere near the village of Byal Izvor, but the source of pollution is actually a dairy in the village of Zhaltusha, Ardino municipality. The increased control of the dairy enterprises in the region continues.

The control of the sites in the industry "Fish processing" - "P.A.L. BG "EOOD, city of Sofia, Fish processing workshop in the village of Beden, Devin municipality and ET" NIK 60 - Nedyalko Kolaksazov ", city of Plovdiv," Fish processing workshop "in the village of Hvoyna, Chepelare municipality.

3.3.4. GROUNDWATER PROTECTION

Monitoring network of the chemical condition of Groundwater

On the territory of RIEW-Smolyan are located bigger or smaller part of 6 underground water bodies.

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It should be noted that the register of groundwater protection zones intended for drinking water supply includes all groundwater bodies on the territory of the EABD, due to their use for drinking water supply.

In 2019, the National Network for Operational Monitoring of the Chemical Condition of Groundwater on the Territory of RIEW-Smolyan, includes 18 hydrogeological monitoring points according to Order № RD-230 / 28.03.2019. of the Minister of Environment and Water, as follows:

- BG3G00000PTMP205 - Spring "Dupkata", village of Smilyan, Smolyan municipality;
- BG3G00000PTMP207 - Spring "Hubcha", Smolyan, Smolyan municipality.;
- BG3G00000PTMP081 - Spring "Serafimovsko dere", town of Rudozem, Zlatograd municipality;
- BG3G00000PTMP190 - Traverban Gallery №1, Alamovtsi village, Zlatograd municipality;
- BG3G00000PTMP200 - Captured spring - fountain, Madan - Zlatograd;
- BG3G00000PTMP201 - Captured spring - fountain, Madan - Zlatograd;
- BG3G00000PgMP078 - "Braloto" spring, Raykovo quarter, town of Smolyan, Smolyan municipality;
- BG3G000A + PtMP099 - Spring - NIHM № 39a, Beden village, Devin municipality;
- BG3G00000PtMP100 - Spring - NIHM № 336, Mugla village, Smolyan municipality;
- BG3G000A + PtMP101 - Spring "Glavata", Erma reka village, Zlatograd municipality;
- BG3G000A + PtMP104 - Spring "Marzyan-1, 3", town of Nedelino, Nedelino municipality;
- BG3G000A + PtMP105 - Spring "St. Ivan", town of Smolyan, Smolyan municipality;
- BG3G00000PtMP077 - Spring "Holy Spirit", town of Chepelare, Chepelare municipality;

Characteristic of the Ground Water Bodies (GWB).

In 2019, all groundwater bodies on the territory of RIEW-Smolyan are in “good” chemical condition.

In 2018, the RV (relevant value) for groundwater body BG3G000PtPg049 / Cracked Waters - Eastern Rhodope Complex for the indicator Arsenic exceeded the limits. The measured concentration of arsenic was 10.25 µg/l (when the limit is 10 µg/l). For 2019, the RV for the indicator arsenic is 1,37 µg/l.

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In the monitoring point: "Captured spring - fountain", Madan - Zlatograd, BG3G00000PTMP201 were measured concentrations above the limits for the indicator arsenic. The measured values for this indicator in the second and third quarters of the year are respectively: 14.5µg/l and 15, 3µg/l, but the average annual concentration at this monitoring point is below the limit - 7.88 µg/l. The monitoring point is a roadside fountain on the road from Madan to Zlatograd. The general assessment of the chemical condition of GWB BG3G000PtPg049 on the territory of RIEW - Smolyan during the year is "good".

3.3.5. LANDS AND SOIL

3.3.5.1. TERRITORIAL INFORMATION BY MUNICIPALITIES

According to data from the "Strategy for Development of Smolyan region 2014-2020", published on the website of the Regional Administration - Smolyan, the territorial structure of Smolyan region is given in Table 16 as follows:

Table 16. Territorial structure of Smolyan region

Municipalities	Total area /dka/	Agricultural territory	Forest areas	Settlements, etc. Urbanized territory	Water currents and water areas	Areas for extraction of minerals
Banite	301165	111807	163281	5224	1022	18799
Borino	173204	51514	105036	1286	290	14748
Devin	573684	144692	383245	5030	4189	35033
Dospat	282697	65917	197006	3292	10721	4405
Zlatograd	171537	33398	128819	4655	1856	2353
Madan	174951	41795	120989	8277	1263	1295
Nedelino	102252	38663	59226	2706	470	770
Rudozem	182919	26620	146388	5752	1156	2353
Smolyan	853997	232127	540147	16197	3845	58122
Chepelare	376440	104416	249316	5909	871	15102
Total	3192846	850949	2093453	58328	25683	152980

3.3.5.2. SOIL CONTAMINATION WITH HEAVY METALS AND METALLOIDS

In 2017 have been processed the results of the monitoring performed in 2016 at the following

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points: Dryanovo village, Lucky municipality, village of Krastatitsa, Banite municipality, Trigrad and Nastan, Devin municipality and points Kiselchovo and Solishta, Smolyan municipality. For the checkpoints in the villages of Dryanovo and Krastatitsa, are observed lead levels still above the MAC, which assumed that the pollution is background. The results for heavy metals from the other points in comparison with previous years are with concentrations close to the concentrations through the years, which shows that there is no change in the overall picture.

For the checkpoint in the village of Dryanovo, Lucky municipality were measured exceedance concentrations for indicator organochlorine pesticides. For the checkpoint Krastatitsa, Banite municipality were measured exceedance concentrations for indicator of polycyclic aromatic hydrocarbons. The point is also included for monitoring in the next years in order to follow if there is a trend for constant exceedance of the concentrations. No exceedances above the MAC are observed at the checkpoints Trigrad and Nastan, Devin municipality and checkpoints Kiselchovo and Solishta, Smolyan municipality.

In 2018 have been processed the results of the monitoring performed in 2017 at the following points: Dryanovo village, Lucky municipality, village of Krastatitsa, Banite municipality, village of Barutin, Dospat municipality, village of Chokmanovo, Smolyan municipality, Planinsko village, Banite municipality, village of Mihalkovo, Devin municipality and the village of Dimanovo, Nedelino municipality.

During the monitoring performed in 2016 at the Dryanovo and Krastatitsa checkpoints, were reported exceedances of organochlorine pesticides and polycyclic aromatic hydrocarbons. No excesses were observed from the analysis of the taken samples in 2017. As the sites are located on agricultural land with a land use status "arable land", it is likely that the lands have been treated with plant protection products. For the point in the village of Dryanovo the observed concentrations of indicator lead are still above the maximum allowable concentration, as it is assumed that the pollution is background. The results for heavy metals at the other points, compared to previous years, have similar values, which shows that there is no change in the overall situation.

In 2019 have been processed the results of the monitoring performed in 2018 at the following points: the village of Trigrad, Devin municipality; town of Devin, Nastan quarter; Kiselchovo village, Smolyan municipality; Solishta village, Smolyan municipality; Studenets village, Chepelare municipality; Momchilovtsi village, Smolyan municipality and Vranintsi village, Madan municipality.

The results of the performed in 2018 monitoring show that there are observed exceedances slightly above the maximum allowable concentration of "arsenic" at point Momchilovtsi and "nickel" at point Studenets, which has been established in previous years as well. There are no emitters near these two points that would lead to this exceedance which shows that the pollution is probably background. Exceedance concentrations of "lead" are again observed at Vranintsi checkpoint, located on the territory of Madan municipality. There are deposits of lead-zinc ores in the area and the pollution is probably background.

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No excesses of organochlorine pesticides and polycyclic aromatic hydrocarbons were found in the samples taken at the monitoring points.

The results for heavy metals for the other points, compared to previous years, shows similar values, which shows that there is no change in the overall picture.

In 2019, according to the program for soil monitoring, I level - large-scale monitoring, from the Regional Laboratory - Smolyan soil samples were taken from 3 points, as follows: Krastatitsa village, Banite municipality, Dryanovo village, Lucky municipality and Solishta village, Smolyan municipality. The samples were sent for testing in the Regional Laboratories of the EEA in the country, and the results will be processed in 2020.

3.3.5.3. CONTAMINATION OF SOILS WITH PLANT PROTECTION PRODUCTS /PESTICIDES/

By 2019 on the territory of RIEW-Smolyan are located five warehouses for storage of unusable plant protection products and five sites with 42 pcs. BB cubes as follows:

- warehouses for obsolete PPP - Davidkovo village, Banite municipality; Orehovo village, Chepelare municipality; Taran village in “Gerzovitsa” locality, Smolyan municipality and Satovcha village, Satovcha municipality;
- sites with BB-cubes - Chubrika village, Ardino municipality – 16 pcs.; Barchevo village, Rudozem municipality – 9 pcs.; Slasten village, Satovcha municipality – 4 pcs.; Satovcha village, Satovcha municipality - 5 pcs. and the city of Devin, Devin municipality - 8 pcs.

During inspection conducted in August 2017 on the site for storage of BB cubes in the village of Barchevo, Rudozem municipality have been found leaks from two BB cubes. Prescriptions was given to the Municipality of Rudozem to take measures to stop the leaks and notify RIEW-Smolyan. During the subsequent on-site inspection, it was established that the leaks from the BB cubes have been eliminated. No other irregularities were found on the sites for storage of BB cubes on the territory of the RIEW. During the inspections in 2017 it was established that the warehouses buildings with pesticide are in relatively good condition, the integrity of the fences and the roof construction has not been violated. There is no security at the sites, they are monitored by the mayors of the respective settlements. No spills and spillage of detergents, thefts, unauthorized export and others are detected. There is no change in the number and condition of warehouses and BB cubes.

In 2018, were performed scheduled inspections of all warehouses and sites with BB cubes. During the inspection of the sites with BB cubes irregularities were found on two of them, as follows:

- Site for storage of BB cubes in the town of Devin - Due to the impossibility to carry out a thorough inspection of the cubes, a prescription was given to the municipality of Devin to remove the sprouted grass vegetation and clean the existing domestic waste. Subsequent on-site inspections did not reveal any leaks or other irregularities

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from the cubes.

- Site for storage of BB cubes in the village of Chubrika, Ardino municipality. Leaks were found from three of the cubes. An prescription was given to the municipality of Ardino to take measures to stop the leaks and to notify RIEW-Smolyan in writing about the taken actions. A subsequent on-site inspection revealed that the problematic BB cubes had been rehabilitated and the leaks had been stopped. No other irregularities were found on the sites for storage of BB cubes on the territory of the inspection.

The condition of the warehouses for pesticide and BB cubes is periodically monitored by the mayors of the settlements on territory where they are located. The inspections revealed that the warehouses were in relatively good condition. The integrity of the fences and the roof construction has not been violated. No spills and spillages of detergents, thefts, unauthorized export and others are detected.

In October 2018, a public procurement contract was signed, with subject: “Repackaging, transport, delivery for final disposal and cleaning of warehouses containing pesticides, hazardous waste, non-hazardous waste and other plant protection products (PPP)” with 6 designated positions, including Lot 6:“ Warehouses on the territory of RIEW-Plovdiv, RIEW-Smolyan and RIEW-Haskovo”. The selected contractor possessed a permit for waste treatment, but at this stage no action has yet been taken to liquidate the warehouses for storage of unusable PPPs.

The inspections conducted in 2019 established that the warehouses are in relatively good condition. The integrity of the fences and the roof construction has not been violated. No spills and spillages of detergents, thefts, unauthorized export and others are detected. During a scheduled inspection in August, at the site for storage of BB cubes in the village of Barchevo, Rudozem municipality, leaks of one BB cube were found. Prescription was given to the municipality of Rudozem to take measures to stop the leak. During the subsequent control it was established that Balbok Engineering AD - Sofia has performed warranty service of the BB cubes, as the problematic BB cube has been partially repaired and the leaks have been stopped. No irregularities were found during the year on the other sites with BB cubes.

In 2019 on the territory of RIEW - Smolyan no action has been taken to liquidate warehouses for storage of unusable PPPs, according to the contract from 2018 for implementation of a public procurement with subject: "Repackaging, transport, delivery for final disposal and cleaning of warehouses containing pesticides, hazardous waste, non-hazardous waste and other plant protection products (PPP)", under project: "Environmentally friendly disposal of obsolete pesticides and other expired plant protection products", funded by the Bulgarian-Swiss Cooperation Program. The control over the operational condition of the walls, the systems for monitoring the pressure filtration and the resistance to dynamic and static loads is carried out by State Agency for Meteorological and Technical surveillance (SAMTS).

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3.3.5.4. SOIL POLLUTION WITH PERSISTENT ORGANIC POLLUTANTS, INCL. PETROLEUM PRODUCTS.

During the period 2017-2019, no signals were received and no excessive pollution with persistent organic pollutants, including petroleum products, was found.

3.3.6. SOIL EROSION

Soil erosion is a process of destruction, transport and deposition of soil particles, mainly by wind and rainwater, during natural and / or anthropogenic processes. The loss of soil material has a significant impact on soil functions, both at the site of erosion and on the surrounding areas. Erosion reduces the amount of nutrients and soil moisture reserves.

The light mechanical composition of the soils in the area, the large slopes and the strong relief dissection favor the erosion processes. Along with the natural factors, the degree of soil erosion depends on human activity as well. Improper tillage, deforestation and forest fires are also significant factors influencing this process.

The presence of large areas with disturbed soil cover from the activities of mining companies and the illegal extraction of rock materials are a prerequisite for erosion. Heavy rainfall is another factor that causes the removal of soil cover.

3.3.6.1. SALINIZATION AND ACIDIFICATION OF SOILS

During the period 2017-2019, level II monitoring was performed - acidification in four points – “Rozhen”, Borino, Dospat and Satovcha. The results of the analyzes from all points showed an acid-base balance in the soil wit value from pH 4 to pH 5; In 2017, the Regional Laboratory - Smolyan implemented the monitoring program according to the instructions of the Executive Environment Agency (EEA). The results of the analyzes for 2018 show acid-base balance in the soil at a value from pH 3 to pH 4, which preserves the trend of recent years of high soil acidity in the region. The results of the analyzes of all points in 2019 have shown acid-base balance in the soil, in the range from pH 4 to pH 5. On the territory of RIEW - Smolyan no monitoring is carried out for salinization of soils in the region.

3.3.6.2. UNREGULATED DUMPING OF WASTE ON THE SOIL SURFACE (CONSTRUCTION, DOMESTIC, INDUSTRIAL AND AGRICULTURAL WASTE)

Still continues the control over settlements for prevention of unregulated pollution with domestic and construction waste. There is a systematic control over the fulfillment of the obligations of the mayors of municipalities, arising from the Waste Management Act, regarding the illegal dumping of waste in unauthorized places, the formation of illegal dumps / pollution, their cleaning, as well as taking preventive measures to prevent or limit their occurrence.

3.3.7. ANALYSIS OF THE IMPACTS FROM THE FACTORS

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3.3.7.1.WASTE

All municipalities controlled by RIEW - Smolyan have developed and implement a Waste Management Program, corresponding to of the structure and objectives of the National Waste Management Plan (NWMP), with a term until 2020. This aims to fulfill the processes for implementation of measures and control for protection of the environment and human health by preventing or reducing the harmful impact from the generation and management of the waste, regulated in the WMA.

Separate collection of waste

On the basis of concluded contracts with recovery organizations, continues the separate collection waste from packaging in the municipalities of Satovcha and Lucky. In 2019, the recovery organizations unilaterally terminated its contracts with the municipalities of Smolyan, Madan and Rudozem.

Systems for separate collection of paper, plastic, glass and metal waste from the population, commercial sites, industrial and administrative buildings in the municipalities of Smolyan, Zlatograd, Ardino, Rudozem and Devin have been introduced.

According to the requirements of Art. 19, para. 3, point 11 of WMA the settlements with population more than 10,000 inhabitants should have sites for free transfer of separately collected waste from households (paper, plastic, glass, obsolete electrical and electronic equipment, green waste, bulky waste and etc.). The scope of the RIEW includes only the city of Smolyan, and in fulfillment of this obligation the municipality has provided two sites, based on concluded contracts for acceptance of waste with licensed companies.

There are six municipalities that have concluded contracts with organizations for separate collection of unusable batteries and accumulators - Smolyan, Devin, Borino and Lucky, Satovcha and Chepelare. The municipalities of Smolyan, Devin, Lucky, Satovcha and Chepelare have concluded contracts with organizations for the introduction of a system for separate collection of obsolete electrical and electronic equipment. Campaigns for the collection of obsolete electrical and electronic equipment are organized.

A practice has been established in all municipalities on the territory of RIEW - Smolyan to carry out separate collection of green waste from public areas, parks and gardens and to deposit it on municipal land for their natural decomposition.

Domestic waste

The collection and transportation of domestic waste is the responsibility of the municipalities. The number of the population served by the garbage collection and disposal system is 144463, which represents 99.89% of the total population. Nine of all 308 settlements are not covered by the system, due to the low number of inhabitants and the difficult accessibility, of which - one in Smolyan municipality - Chuchur village, two in Rudozem municipality - Dobreva cheresha village and seven villages in Ardino municipality: Avramovo, Doyrantsi, Latinka, Lyubino, Mak, Pesnopoy, Temenuga.

Due to the mountainous nature of the territory, the collection of domestic waste is carried out with small, easily passable garbage trucks. This requires congestion of waste from municipalities that are remote from regional landfills. Such are the municipalities of Devin and Ardino, which

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have issued documents under Article 35 of the WMA for transshipment sites for municipal waste.

The installations for disposal of domestic waste on the territory of the inspection are as follows:

- Regional landfill for non-hazardous waste - Rudozem, located in the village of Barchevo – deposition of the waste of the municipality of Rudozem;
- Regional Landfill for Non-Hazardous Waste Madan – deposition of the waste of the municipalities of Madan, Zlatograd and Nedelino;
- Regional Landfill for Non-Hazardous Waste Smolyan – deposition of the waste of the municipalities of Smolyan, Chepelare and Banite;
- Regional Landfill for Non-Hazardous Waste, Dospat, located in the village of Barutin – deposition of the waste of the municipalities of Dospat, Devin, Borino, Satovcha and Sarnitsa

The municipality of Lucky deposited of its domestic waste at the regional landfill Asenovgrad, and the waste from the municipality of Ardino is disposed of at the regional landfill Kardzhali.

All municipalities participate in regional associations

Sludge from WWTP

Disposal of WWTP sludge in the cities of Smolyan, Madan, Zlatograd, Rudozem and Pamporovo is carried out by depositing the regional landfills on the territory of RIEW - Smolyan. The collected sludge from the waste water treatment plants in settlements in the municipality of Devin and the municipality of Satovcha are cleaned with a specialized machine and transported for additional treatment to other treatment plants. In 2019 no sludge has been transferred from the treatment of wastewater for utilization in agriculture and for reclamation of disturbed terrains.

The planned drying fields to the waste water treatment plants are only for emergency situations and it is not possible to use them for additional stabilization of the sludge.

Construction waste

There are no landfills for construction and inert waste on the territory of RIEW - Smolyan. The generated construction waste is disposed of at the regional landfills for non-hazardous waste.

Ardino Municipality has issued by RIEW - Smolyan registration document №11-РД-328-00 from 01.12.2017 for collection and temporary storage of construction waste / concrete, bricks, tiles, faience and ceramics, etc./ for the site, located in location “Mekteb Yan”, land of the city of Ardino.

There are no operating installations for utilization of construction waste on the territory of the inspection. In 2019, continues the control on received signals and complaints for contaminated areas with construction waste. For established unregulated pollution with such waste, prescription have been given, which are fulfilled. Most of the detected pollutions with waste are of a mixed nature - construction and domestic waste.

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3.4. KARDZHALI AND HASKOVO REGION

3.4.1. TERRITORIAL SCOPE

Territorial scope of Kardzhali region

According to data from the Regional Report of the Environmental conditions for 2019 issued by RIEW Haskovo and the Regional Development Strategy 2014-2020, Kardzhali region occupies 3,209.1 km² in the southeastern part of the Republic of Bulgaria, which represents 2.9% of the country's territory. Located in the South Central region. It borders to the west with Smolyan region, to the north with Haskovo and Plovdiv regions, to the south and southeast with the state border of the country with the Greece Republic. The administrative-territorial boundaries of Kardzhali region include seven municipalities - Ardino, Dzhebel, Kirkovo, Krumovgrad, Kardzhali, Momchilgrad and Chernoochene. (Fig. 14)



Figure 14. Regional map of Kardzhali region

Physico-geographical and economic characteristics:

The region occupies most of the Eastern Rhodopes. The economy of the region is determined by the extraction and processing of mineral raw materials, polymetallic ores (production of precious metals), metalworking, machine building, textile industry, wood processing, furniture industry, food enterprises and tobacco production for the population outside the cities. In

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recent years, the extraction and processing of lead-zinc ores have been discontinued, but the production of plastic and rubber elements for the automobile industry, as well as related industries, is growing. The implementation of a project for the construction of a new zinc plant on the site of Lead and Zink Complex is underway, starts mining and processing of gold-bearing ores from deposits in the region of Krumovgrad.

The location determines the possibility of the area for cross-border cooperation, expressed in the development of trade, tourism, implementation of joint business projects and more. The prospects for development of the region are very much related to the opportunities for integration of Kardzhali region with the neighboring regions and to the creation of preconditions for common use of resources and potential. There is an opportunity to create common tourist products and destinations, joint advertising campaigns, use of shopping malls, logistics centers and border checkpoints in other areas and more. The All-European Transport Corridor (AETC) passes through the territory of Kardzhali region № 9 Helsinki - St. Petersburg - Moscow / Pskov - Kiev - Lyubashevka - Chisinau - Bucharest - Ruse - Dimitrovgrad - Makaza Pass - Alexandroupolis. The transfer of international tourist flows between Romania, Bulgaria and Greece is carried out most often through the Kapitan Petkovoyvoda border checkpoint (Haskovo region) and the Kapitan Andreevo border checkpoint (Haskovo region) and the Makaza border checkpoint (Kardzhali region) opened in early September, 2013.

Territorial scope of Haskovo district

Haskovo region is located in the southeastern part of the South Central region. It includes 261 settlements organized in 11 municipalities: Haskovo, Dimitrovgrad, Harmanli, Simeonovgrad, Svilengrad, Madzharovo, Ivaylovgrad, Lyubimets, Mineralni Bani, Stambolovo and Topolovgrad with a total area of 5543 km². (Fig. 15)



Figure 15. Regional map of Haskovo region

Physico-geographical and economic characteristics:

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The northern and central part of the region is occupied by the Upper Thracian lowland and is characterized by extensive riparian lowlands and high groundwater, which favor the intensive use of agricultural land. The water resources of the territory are formed mainly by the outflow of the Maritsa River and its tributaries, the Harmanliyska River, the Banska River and others. To the south, a large part of the region is occupied by the low hilllands of the Eastern Rhodopes and the western slopes of Sakar Mountain. The Eastern Rhodopes are a unique territory, characterized by rich flora and fauna. The natural and geographical conditions of the district have determined the development of the production of nitrogen fertilizers, machine building, food and other industries, logging and woodworking industry, footwear industry, clothing and knitting industry. The food industry is represented by the bakery, confectionery, meat processing units, beer production, milk processing, tobacco and canning industries. In recent years, there has been an accelerated development of wine production, animal husbandry (mostly cows and ducks) and others. The largest industrial center is the town of Dimitrovgrad, where the sites of energy, chemical and mining industries are concentrated.

Agriculture is one of the leading industries for Haskovo region and creates employment for a large part of the population. **In the region exist extremely favorable soil and climatic conditions for the development of crop production. A variety of crops are grown, including: wheat, barley, corn. Of the technical crops the most widely grown are sunflower, cotton and tobacco. In the Haskovo region there are extremely favorable conditions for growing massifs of perennials - strawberries, raspberries, sour cherries, cherries, apricots, peaches and others. Traditionally, vineyards are grown in the area.** The region is known for the good varieties "Merlot", "Cabernet Sauvignon", "Pamid" and "Bulgar". Several wine centers in the district attract supporters of the so-called "wine tourism". **The livestock sub-sector is extremely concentrated in the private sector. Mainly are raised Cows, sheep, goats and pigs. In recent years, there has been a significant increase in duck farms and others.**

The climate as a whole is favorable for the development of various economic branches - construction, transport, etc. In combination with other natural conditions and resources, the climate has a significant impact on the agricultural specialization and profiling of the individual parts of the municipality of Haskovo. The plains of the northeastern parts specialize in the cultivation of vegetables (tomatoes, peppers), fruits (apples, pears, grapes), industrial crops (cotton, sunflower, sugar beet, tobacco), and the southern parts - in the cultivation of tobacco. There are extremely favorable soil and climatic conditions for the creation of vineyards, as a potential for the development of viticulture and winemaking. Soil fertility is extremely rich and is represented by all soil types typical for the area: resinous, alluvial-meadow and deluvial soils and cinnamon forest soils.

3.4.2. ANALYSIS OF THE MAIN ENVIRONMENTAL COMPONENTS

3.4.2.1. CLIMATE AND AMBIENT AIR

Kardzhali region:

According to the Regional strategy for regional development 2014-2020, the nature of the atmospheric transition and transformation of the air masses on the surface of the relief

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determines the formation of the transitional-continental and transitional-Mediterranean climate. The average annual temperature is around 12-13⁰C, and the annual precipitations are within value of 700-800 mm. The region falls within the South Bulgarian climatic region and more precisely in the Eastern Rhodope climatic region with a warm Mediterranean influence. Winters are relatively mild. Minimum temperatures during the winter months are relatively high - the average temperature is about 0 degrees. The days with snow cover are 39. The summer is long and hot, with maximum temperatures reaching 39-40⁰C and averages temperatures of about of 24 degrees. During the autumn-winter period, under the influence of Mediterranean cyclones, some of the heaviest rainfall is falling. There are two maxima: winter - November, December, January; spring - May, June, July, and one minimum - August, September. Due to the southern position of the area, most of the winter precipitation falls in the form of rain or rain and snow. Rainfall is with very low quantity (one of the lowest in the country) and fall in late summer and spring. These periods coincide with the critical periods of the development of spring crops and make the climatic conditions poorly suitable and unsuitable for most of them.

Haskovo region

According to data from the Regional strategy for regional development 2014-2020, the territory of Haskovo municipality has a typical hilly relief and is a northern continuation of the Eastern Rhodopes (Haskovo hilly region). The low altitude and the typical hilly relief on the territory of Haskovo municipality are prerequisites that form a clear transitional nature of the climate. According to its climatic features, the region belongs to the South Bulgarian climatic subregion of Mediterranean influence, which determines mild winters and hot summers. This strongly emphasized Mediterranean influence is mainly expressed by higher annual temperatures and more sensitive movement of the main high precipitations and low precipitations. The absolute value of the maximum temperatures is assessed as one of the most favorable for the country. The average annual air temperature is 12.5^oC, and in the plains and lowlands it varies from 12.2^oC to 12.8^oC. The thermal potential of the region with its territorial differentiation affects the types of the cultivated crops, among them are highly heat-loving - cotton, tobacco, grapes, etc. Typical for the region is mild and warm winter and sunny and relatively long autumn. Climatic conditions and water resources are a very important prerequisite for economic activity in the municipality. The regional climate, assessed as one of the favorable in the country, provides opportunities for economic initiatives in the municipality and agricultural participation of the local population.

3.4.2.2. AMBIENT AIR QUALITY

According to data from the regional reports on the environmental condition of RIEW Haskovo for the period 2017-2019 the condition of the ambient air in the regions of Haskovo and Kardzhali is monitored by two AMS and one manual checkpoint of the Ministry of Environment and Water:

- AMS "Rakovski" - categorized as a city background point, located in the built-up part of the town of Dimitrovgrad, reporting the impact of emissions from production activities and emissions from the household sector. The sampling results are displayed hourly (automatically). It is serviced by RL – Haskovo, branch EEA. AMS -

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Rakovski controls the following indicators for ambient air quality: PM₁₀, SO₂, NO₂, CO, H₂S, NH₃ and O₃.

- AMS “Studen Kladenets” - categorized as an urban background point, located in the built-up part of the town of Kardzhali, reporting the impact of emissions from production activities and emissions from the household sector. The sampling results are displayed hourly (automatically). It is serviced by RL – Haskovo, branch of EEA. AMS – “Studen kladenets” controls the following indicators for ambient air quality - PM₁₀, Pb aer., SO₂, NO₂, CO, H₂S, NH₃ and O₃.
- "RIEW - Haskovo" - categorized as urban background, with manual sampling and subsequent laboratory analysis. The point works five days a week, performing four hourly samplings in the light part of the day. The following indicators for ambient air quality are analyzed: SO₂ and NO₂. For PM₁₀, cadmium and surfactants, sampling is 24 hours. In the event of accidents (accidents, fires, deteriorating weather conditions, etc.) that can lead to deterioration of air quality, an accelerated sampling schedule is introduced.

Fine dust particles (PM10)

During the period 2017-2019 is monitored reduction of PM₁₀ pollution on the territory of RIEW-Haskovo, where are located the regions of Haskovo and Kardzhali. This ambient pollutant is controlled daily at 3 points.

During the period 2017 - 2019 the following exceedances of the daily average norm (DAN) for protection of human health (concentrations above 50 µg/m³) have been registered in points as follows:

- in AMS "Rakovski", located in the town of Dimitrovgrad - for 2017 - 48 pcs., for 2018 - 35 pcs., for 2019 - 17 pcs.
- in AMS "Studen Kladenets", located in the town of Kardzhali - for 2017 - 58 pcs, for 2018 - 43 pcs., for 2019 - 22 pcs.
- in the manual checkpoint "RIEW - Haskovo", located in the town of Haskovo - for 2017 - 69 pcs., for 2018 - 62 pcs., for 2019 - 36 pcs.

The comparative analysis of the registered values in the monitoring points by years shows a positive trend, as the registered exceedances of the average daily norm of 50 µg/m³ for the period are reduced by almost half. Full compliance with the normative requirements for air quality in Dimitrovgrad and Kardzhali has been achieved, and for Haskovo the exceedance of the ADN over the permissible 35 pcs./year is only one. The ABN is set in the Ordinance № 12 of 15.07.2010 for standards for sulfur dioxide, nitrogen dioxide, fine dust particles, lead, benzene, carbon monoxide and ozone in ambient air.

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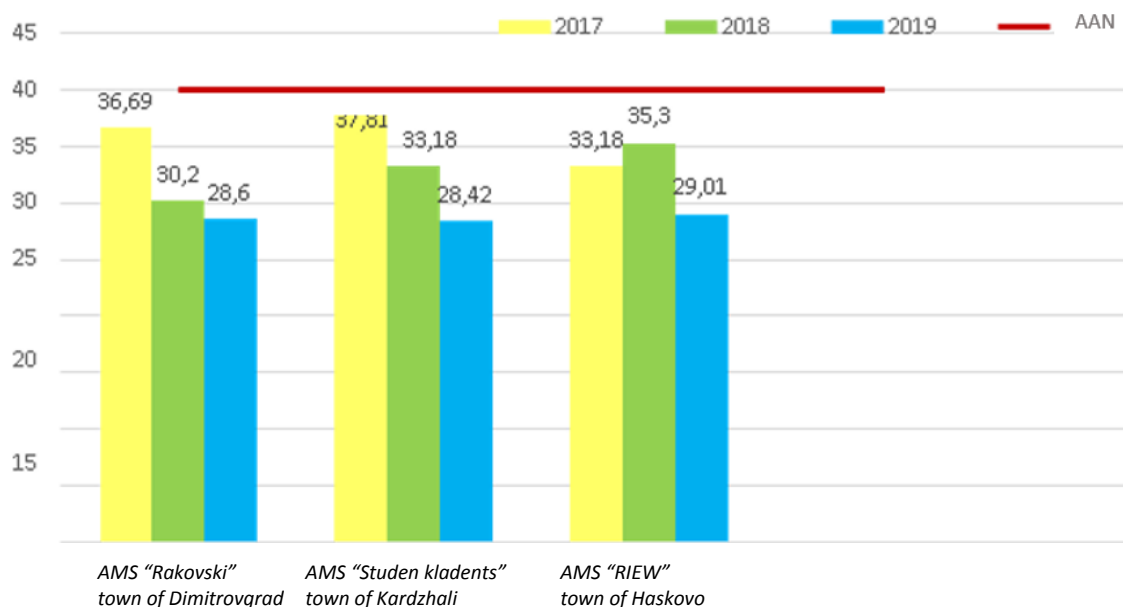


Figure 16. Exceedances of AAN for the period 2017-2019 for the indicator PM10

As shown in Fig. 16 for the period 2017 - 2019, the measured average annual concentrations (AAN) of PM₁₀ are lower than the average annual norm of 40 µg/m³. The tendency for decrease of the average annual concentration of PM₁₀ continues.

During the studied period the pollution of the ambient air with PM10 is mainly during the autumn-winter period. The main reasons for this are the combustion processes in the domestic, commercial and administrative sector and the use of solid fuel, linear and mobile point sources of emissions - roads, highways, street network in settlements, road transport. The climatic conditions during the autumn-winter period also contribute – there are no wind and fog.

Sulfur dioxide

The trend for the period 2017-2019 shows a decrease in sulfur dioxide pollution on the territory of RIEW-Haskovo, where the regions of Haskovo and Kardzhali are located. In 2017 In AMS "Rakovski" were measured 5 exceedances of the TV and AHN of 350 µg/m³ on the indicator sulfur dioxide, In 2018 were measured 5 exceedances of TV for AHN of 350 µg/m³ and one exceedance of TV for ADN of 125 µg/m³ on sulfur dioxide indicator, as they do not exceed the admissible number values for one calendar year (respectively 24 and 3). In 2019, were registered 4 exceedances of TV for ADN of 350 µg/m³. No exceedance of TV for AND of 125 µg/m³ was registered. The excessedances are due to the transfer of emissions from the energy complex "Maritsa Iztok" - Stara Zagora, when the direction of the wind is from the northeast. There is a steady trend for compliance with the admissible number of exceedances of the norms for sulfur dioxide.

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For the period 2017-2019 no exceedances of the legislative admissible concentrations for sulfur dioxide were registered in the other two points - RIEW - Haskovo and AMS "Studen Kladenets". Compliance with the standards for sulfur dioxide continues.

Polycyclic aromatic hydrocarbons (surfactants)

In 2019, in the manual checkpoint “RIEW-Haskovo” - Haskovo, was measured 1 ng/m³ average annual concentration of surfactants which corresponds to the average annual target value of 1 ng/m³. There is a decrease compared to 2017 and 2018, when the measured average annual concentrations were of 2.8 and 1.73 ng/m³.

The average annual concentration of surfactants, measured in 2019 in AMS "Studen Kladenets", town of Kardzhali is 1 ng/m³ and meets the average annual target value of 1 ng/m³. There is a decrease in the measured concentration of surfactants compared to 2017 and 2018, when the measured values for this indicator were 1.85 and 1.73 ng/m³, respectively.

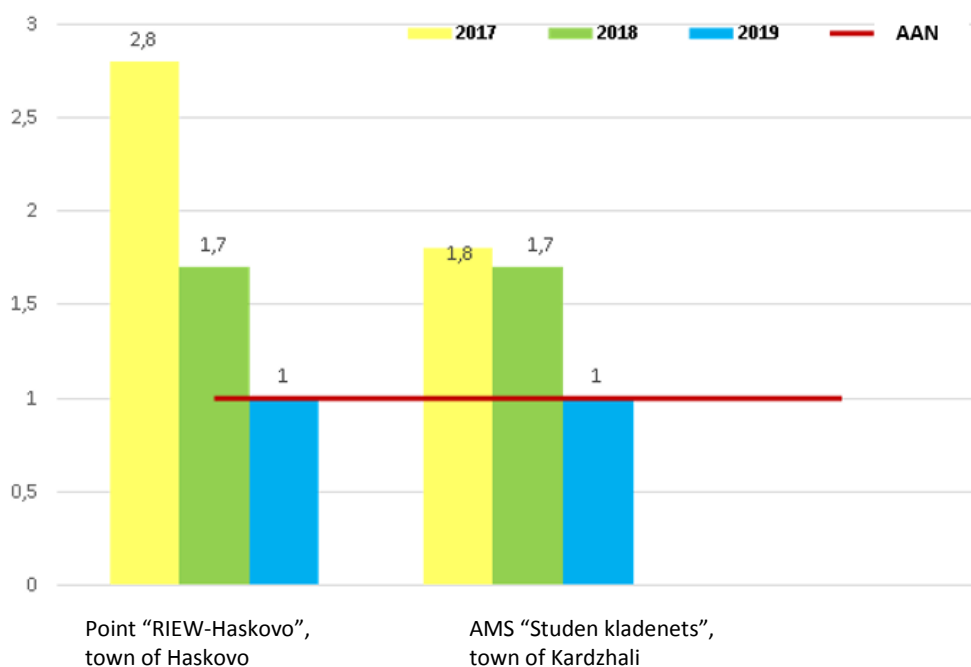


Figure 17. Average annual concentration of surfactant benzo (a) pyrene in ng/m³ for the period 2017-2019

The main reason for air pollution with surfactants is the incomplete combustion of various types of fuels - coal and diesel fuel, including the household sector. During this three-year period, there is a tendency to reduce the concentration of surfactants, which is in directly correlation to the reduced concentrations of PM₁₀, as the measurement of surfactants is in a fraction of PM₁₀.

Ozone

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Ozone is a gas naturally contained in the atmosphere (ground layer). Ground-level ozone is formed by complex chemical reactions with other atmospheric pollutants such as nitrogen oxides, methane, non-methane volatile organic compounds and carbon monoxide, known as ozone precursors under the influence of high temperature and sunlight. These processes occur most often during the summer period of the year.

Ozone is controlled by AMS "Rakovski" – town of Dimitrovgrad and AMS "Studen Kladenets" – town of Kardzhali. During the period 2017 – 2019, no exceedances of the eight-hour average values of the short-term target norm of 120 µg/m³ have been registered and no exceedances of the threshold for informing the population of 180 µg/m³ have been registered in the both points AMS "Rakovski" and AMS "Studen Kladenets".

Hydrogen sulfide

In 2017 in the town of Dimitrovgrad are registered 3pcs measurements exceeding the average daily value of 0.003 mg/m³. In 2019 are registered 918pcs measurements exceeding the MAC for one hour (0.005 mg/m³) and 97 pcs. measurements exceeding the daily average value (0.003 mg/m³). In 2018 at the AMS "Rakovski", Dimitrovgrad are registered 1003 pcs. measurements exceeding the MAC for one hour and 165 pcs. measurements exceeding the daily average value. The largest number of measurements were registered in January, February, September, November and December. The registered exceedances during the winter period are due to the increased consumption of solid fuels in the household sector.

The territory of the country is divided into regions for assessment and management of air quality. The municipalities of Haskovo and Dimitrovgrad fall in the southeastern region, the municipality of Kardzhali - in the southwestern. In connection with the reduction of PM₁₀ emissions, the municipalities have updated their air quality programs, respectively the Municipality of Haskovo in 2016, the Municipality of Kardzhali in 2017 and the Municipality of Dimitrovgrad in 2018. In each of these three municipalities the implementation of the measures set out in the municipal programs, such as rehabilitation and gasification of public and industrial enterprises, continues. However, the amount of the used gaseous fuels is incomparable with the large amount of solid fuels used in the combustion installations of the household sector. The implementation of the measures and planned activities of the Programs for the cities of Dimitrovgrad, Kardzhali and Haskovo should strengthen the established trend for reduction the number of exceedances and registered average annual concentrations of PM₁₀ for Haskovo and Kardzhali and full compliance with the regulative norms for Dimitrovgrad.

3.4.2.3. SOURCES OF AIR EMISSIONS

RIEW - Haskovo controls enterprises, fixed sources of emissions, as well as sites using fluorinated greenhouse gases and substances that deplete the ozone layer and volatile organic compounds.

For 2019, were conducted emission measurements at both planned for monitoring sites which

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are also included in the approved schedule for emission control - installation for charcoal production “Gorsi” OOD, village of Gruevo and the greenhouse for vegetable production “Agro Omega” EOOD, town of Lyubimets. The results of the conducted monitoring measurements for sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide and dust from the emitting device to the boiler "BRUNA" 4.5 MW of the greenhouse for vegetable production "Agro Omega" EOOD in Lyubimets show exceedance of the permissible emission standards only for the measured carbon monoxide concentration. An ongoing sanction has been imposed on the operator.

The control of the emitted harmful substances from the emission sources was carried out through own periodic measurements (OPM) by licensed laboratories. Reports on the results of the performed measurements of 12 emission sources incl. “Trakia Dairy Products” EOOD, town of Haskovo; "Kamenitza" AD – brewery, town of Haskovo, show that the presented OPM are within the normatively established.

In connection with the requirements of Ordinance № 7 on permissible emission standards for volatile organic compounds released into the atmosphere as a result of the use of solvents in certain installations, were conducted 12 scheduled inspections of sites performing activities: coating of metal, adhesive coatings, surface cleaning, extraction of vegetable oils and animal fats, dry cleaning, etc. During the inspections 2 prescriptions were given, which were fulfilled.

By 31.12.2018 RIEW - Haskovo controls 655 pcs. refrigeration and air conditioning systems with over 3 kg of imports and 5 tCO₂eq F-Gas, 30 users and one distributor of fluorinated greenhouse gases. In connection with the requirements of Ordinance № 1 of 17 February 2017 on the procedure and manner of training and issuance of qualification documents for persons performing activities with equipment containing fluorinated greenhouse gases, as well as on the documentation and reporting of emissions of fluorinated greenhouse gases and Ordinance establishing measures for the implementation of Regulation (EU) № 1005/2009, on substances that deplete the ozone layer, the annual reports of operators, users and distributors of ozone-depleting and fluorinated greenhouse gases are presented.

In 2019, the total number of inspections for control and management of F-Gas and ozone-depleting substances is 70pcs., two of which are unplanned. There were given 17 prescriptions, which are fulfilled. The trend of replacing ozone-depleting substances in refrigeration and air-conditioning systems with fluorinated greenhouse gases continues. RIEW - Haskovo carries out control in connection with the complete abandon for placing on the market and use of hydrochlorofluorocarbons (HCFCs) from 01.01.2015 and requires the necessary documentation related to the decommissioning of controlled substances.

In compliance with the requirements of the Climate Change Limitation Act, within the Monitoring Plan for 2019 are included three plants – “Neochim” AD, Termal Power Plant (TPP) “Maritsa” 3 AD, town of Dimitrovgrad and “Harmanliyska Keramika” AD, town of Harmanli. No discrepancies were found during the monitoring.

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3.4.3. WATER

3.4.3.1. SURFACE WATER PROTECTION

The Maritsa River is recipient of the discharged untreated domestic wastewater from a large number of settlements from upstream and from the towns of Harmanli, Simeonovgrad, Lyubimets and Svilengrad, where a WWTP was built and put into operation in 2015. It also discharges the industrial wastewater of Neochim AD, Dimitrovgrad and TPP Maritza 3 AD, Dimitrovgrad. This has affected on the condition the waters in the river. The wastewater from the sewerage system of the town of Haskovo affected the Harmanliyska River. These waters are treated since 2012, but the wastewater from the villages through which the Harmanliyska River flows are still untreated.

Arda River is another major recipient of untreated domestic wastewater from many settlements along the river and also recipient of industrial wastewater, mainly from mining and processing of metal ores.

Typical for the dams built on the river on the territory of RIEW - Haskovo is the deposition on their bottom of sediments containing heavy metals. These factors determine the “poor” condition of some water bodies along the Arda River. Even small amounts of heavily polluted wastewater, when discharged into low-water receivers, often lead to poor condition and even incidents of fish extinction. Such is the case with the Banska River, which receives untreated domestic wastewater from several villages, treated water from the Northern Industrial Zone Haskovo and unregulated discharges from several livestock farms. This also applies to the Merichlerska River, which receives untreated domestic wastewater, water from a small dairy plant and pollution from livestock activities.

When designing the network for control monitoring of surface waters on the territory of the Eastern Aegean Region, there were selected representative monitoring points for the respective river basins and the types of water bodies.

The total number of control monitoring points on the territory controlled by RIEW-Haskovo in 2019 is 10 points - 6 on rivers and 4 on dams. The results of 5 points (2 on rivers and 3 on dams) are reported to the European Commission. In connection with determining the ecological and chemical status of surface water bodies in these points monitoring of biological and physico-chemical elements is carried out. Monitoring of hydromorphological quality elements is planned once for the period of implementation of the RBMP.

- Maritsa River – town of Svilengrad
- Harmanliyska River - the village of Trakiets
- Varbitsa River near the village of Varli dol
- Krumovitsa River - before the outflow
- Byala River - the village of Meden Buk
- Perperek river, Gorna Krepost village

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- Kardzhali dam - wall
- Cold well dam - wall
- Ivaylovgrad dam - wall
- Borovitsa dam

Operational monitoring points are placed in those water bodies that are in poor condition and there is a risk that they will not achieve good condition. In 2017, 26 points for operational monitoring were determined on the territory controlled by RIEW – Haskovo – 21 on rivers, 5 on dams. In 2018, 20 points were determined for operational monitoring - 17 on rivers and 3 on dams. In 2019, were determined 19 points for operational monitoring - 18 on rivers and 1 on dams. These points are monitored for physico-chemical quality elements to determine the ecological and chemical status of surface waters.

When determining the chemical status of surface water bodies in 2019, analyses in 41 surface water bodies were performed for the presence of priority substances, and the monitoring results showed excess of the environmental quality standards for chlorpyrifos-ethyl in one water body " Merichlerska River ", and this water body is determined to be in poor chemical condition.

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Table 17. Number of surface water bodies by chemical status on the territory of Haskovo and Kardzhali regions

	WB	Maritsa	Tundzha	Arda	Byala	Total
Chemical condition	Good	21	1	17	1	40
	Bad	1	0	0	0	1
	Unknown	2	0	7	1	10
	total WB	24	1	24	2	51

The analysis of the results of the assessment of the ecological status / potential of surface water bodies shows that in 2019 the water bodies in good ecological condition are 21, in moderate - 25 and in bad and very bad condition there are 5 water bodies. When comparing the results with those in 2018, there is no improvement in the ecological status / potential (in 2018 - 21 water bodies are in good ecological status, 24 in moderate and 5 water bodies in poor and very poor ecological status / potential). The main physico-chemical indicators by which deviations are observed are related to organic pollution - orthophosphates, total phosphorus, ammonium nitrogen, nitrite nitrogen, total nitrogen and BOD, the cause of which is untreated wastewater from settlements, as well as discharge of industrial wastewater.

Table 18. Number of water bodies distributed by ecological status / potential in Haskovo and Kardzhali districts

condition	Total WB	Maritsa	Tundzha	Arda	Byala	Total
excellent	0	0	0	0	0	0
good	1	0	0	18	2	21
moderate	18	1	1	6	0	25
bad	4	0	0	0	0	4
Very bad	1	0	0	0	0	1
WB	24	1	1	24	2	51

On the territory of the Kardzhali region there are 3 water intakes for drinking water supply from surface waters in the basin of the Arda River - Borovitsa Dam, Kozma Dere River and the Kazatsite River. The data in 2019 show that the three water intakes are in category A2 according to Annex 1 of Ordinance № 12 from 2002 for assessment of the quality of surface water for drinking and household purposes, which determines the good condition of water bodies.

3.4.3.2. SOURCES OF WASTEWATER AND CONDITION OF TREATMENT FACILITIES

The most significant pollutants of surface water bodies in the region of RIEW - Haskovo are the

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sewerage systems of the settlements. On the territory controlled by RIEW - Haskovo WWTP the settlements with over 10,000 p.e. inhabitants are: Haskovo, Dimitrovgrad, Kardzhali, Harmanli and Svilengrad. In December 2010 the WWTP - Dimitrovgrad was put into operation, in 2011 - WWTP - Haskovo, and in 2015 - WWTP - Svilengrad and WWTP - Kardzhali. A WWTP for the town of Harmanli has not yet been built on the territory controlled by the RIEW - Haskovo. Both the controlled and the self-monitoring of WWTP - Haskovo and WWTP Svilengrad in 2019 show good condition of the treatment facilities and compliance with IEL.

In 2015 the WWTP - Momchilgrad was put into operation. The control in 2019 shows compliance with the requirements for discharged water after WWTP. For the other settlements with over 2,000 p.e. inhabitants, the construction of WWTP has not yet started. Wastewater from these settlements continues to be discharged into receiving rivers without treatment.

Small WWTPs have been built and put into operation in the village of Mezek, municipality of Svilengrad, the village of Popovets and the village of Zimovina, municipality Stambolovo, village of Progres, municipality Momchilgrad, village of Biser, municipality Harmanli, village of Sinapovo, municipality Topolovgrad, the village of Egrek, the village of Studen Kladenets, municipality Krumovgrad and Izgrev quarter, Krumovgrad. Some of them do not work efficiently, and in others almost no polluted wastewater enters. Additionally several sewerage systems have been built in the villages with small WWTPs, but they are not put into operation.

The economic sites and activities controlled in 2019 by the RIEW - Haskovo, generating and discharging polluted industrial wastewater into surface waters, for which treatment facilities are needed, are 53.

There are periods in which almost all facilities did not work effectively and sanctions have been imposed under Art. 69 of the EPA or acts have been drawn up. In 2018, the results of the tests of the taken water samples showed compliance with the norms, including the water of the Oil Production Company of "Gold Oil" OOD, Harmanli; Poultry farm of "Galus" AD, Sofia; "Castra Rubra" Wine Cellar in the village of Kolarovo of "T-Wines" AD, Sofia; Meat production and processing enterprise of "Moni Mes" EOOD, Haskovo; WWTP - Haskovo of "ViK" EOOD, Haskovo; WWTP Svilengrad of "ViK" EOOD, Haskovo; WWTP Mezek in the Municipality of Svilengrad and "ViK" EOOD, Haskovo; WWTP of Popovets and Zimovina Municipalities; WWTP Stambolovo of the Municipality of Stambolovo; WWTP town of Momchilgrad of "ViK" OOD, Kardzhali; WWTP Studen Kladenets village, Municipality Krumovgrad, WWTP of Izgrev quarter, town of Krumovgrad, brandy cauldron, town of Haskovo of ET "Roal - Rosen Musov".

The enterprises discharging their wastewater into the city sewerage systems are not planned for control for 2019 by the RIEW. Checks are performed only on received signals.

Business entities with activity generating biodegradable industrial wastewater

The inspected in 2019 enterprises discharging into surface waters, from the activity of which biodegradable industrial wastewater is generated in the region of RIEW - Haskovo are 26 in the Northern Industrial Zone - Haskovo (including Brewery of "Kamenitza" AD, " Bulgarian Dairy

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Company - Haskovo OOD, etc.), meat processing enterprise of "Musan - D" OOD, village of Valkovich, milk processing enterprise of "Pashov YAR" EOOD, village of Valkovich, the wine cellars of "Katarzhina Estate" EOOD, Svilengrad, "Polmos" EOOD, Svilengrad, "Telish" AD, Sofia, "Terra Tangra" OOD, Harmanli, "Vinivel" EOOD, Ivaylovgrad, "MONI MES" slaughterhouse, Haskovo, brandy cauldrons, etc.

As a result of the inspections for discharge of wastewater, non-compliant with IEL, under Art. 69 of the EPA, 7 current and 2 single sanctions have been imposed, incl. to "Kamenitza" AD, Plovdiv - Haskovo Brewery, "Toska" OOD, meat processing enterprise in Haskovo and "Vinivel" OOD, wine cellar in Ivaylovgrad.

After a series of repair and restoration works at the end of 2017 of the facilities at the aerobic stage of WWTP of "Kamenitza" AD, Haskovo Brewery, it was taken over for operation by "Hydrolia" AD, Sofia. In 2019, no exceedances of the IEL were found during the self-monitoring. During control inspections, current sanctions were imposed on Toska OOD, a meat processing enterprise, Vinivel OOD, and a wine cellar in the town of Ivaylovgrad.

For non-compliance with the IEL of "Pashov - YAR" Ltd., Dzhebel, owner of a dairy plant in the village of Valkovich, municipality of Dzhebel, "Musan - D" Ltd., slaughterhouse with a meat processing plant in the village of Valkovich, municipality of Djebel and Euromes 2012 EOOD, town of Kardzhali, slaughterhouse in the village of Enchets, municipality of Kardzhali have drawn up acts under the Law and issued PD. Acts have been drawn up under the Water Act of ET "Hudulov - Mariyka Ivanova", brandy pot in the village of Zlato Pole, municipality of Dimitrovgrad, "Little Star" Ltd., Harmanli, wine cellar in Kolarovo village, municipality Harmanli; Terra Tangra Ltd., Harmanli, wine cellar in the town of Harmanli, "Vinivel" Ltd., wine cellar in the town of Ivaylovgrad, cow farm in the village of Progress, municipality Momchilgrad by Stoyko Georgiev.

In 2019 there is a decrease in the violations regarding water protection - a smaller number of received signals for water pollution, a smaller number and amount of sanctions imposed under Art. 69 of the EPA, a smaller number of drafted acts. However, in 2019 the discharge of untreated or insufficiently treated wastewater and non-compliance with the determined IEL continued at many sites. For 2020, challenge in the field of water still remains the improvement of the ecological condition of the Banska River by identifying and taking appropriate measures against the sources of pollution in case of volley pollution and damage to the river. The goal also remains the improvement of the quality of the discharged waters from Neochim AD, Dimitrovgrad - emitter of large water quantities, with significant potential for impact on the condition of the Maritsa River, as well as from sites, forming highly polluted biodegradable wastewater. The observance of the deadline - 31.12.2020, after which the discharge of the priority dangerous substances cadmium and mercury should be stopped, is also a challenge. In this regard, an additional study of the production sites will be carried out and an assessment of the possibility of priority and priority hazardous substances to be present in their wastewater, the interested parties will be informed about the need to take measures in this direction.

Sites, sources of industrial wastewater, with constructed WWTP and treatment facilities

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All business entities on the territory of RIEW - Haskovo have built treatment facilities with the exception of "Small Star" Ltd., Harmanli, wine cellar in the village of Kolarovo, municipality of Harmanli. However, a large part of these facilities do not work effectively, as shown by the control inspections of wastewater emitters discharged into surface water bodies in 2019, in which exceedances of IEL were found. This is due to obsolete, inefficient or relatively new, but unsuitable for production treatment plants, which are either not maintained in the correct technological mode or are maintained, but can not achieve a high degree of treatment. For established cases of non-maintenance of treatment facilities during the year, 6 acts under the Water Law were issued.

3.4.3.3. GROUNDWATER

Groundwater chemical monitoring network

On the territory of RIEW - Haskovo (Haskovo and Kardzhali region) are located larger or smaller part of 15 groundwater bodies. The register of the groundwater protection zones, intended for WWTP, includes all groundwater bodies on the territory of the EABD, due to their use for drinking water supply.

In 2019 control monitoring has been performed.

The National Network for Monitoring the Chemical Status of Groundwater in 2019 includes 33 hydrogeological points:

- BG3G00AHN12MP249 - Drilling №№ 1 and 4, PS-PBV "Haskovo - 1", Haskovo
- BG3G0ahN1-2MP020 - Kladenets, Malevo village, municipality of Haskovo
- BG3G0ahN1-2MP021 - PS - PBV - 15 Drilling, Haskovo-Eastern zone, municipality of Haskovo
- BG3G0000aQhMP022 - PS - 3 Wells + 6 Drilling, Bryagovo village, municipality of Haskovo
- BG3G00000NMP023 - PS-new, Uzundzhovo village, municipality. Haskovo
- BG3G0000aQhMP024 - Kladenets, village of Strandzhevo, municipality Krumovgrad
- BG3G0000aQhMP025 - Drainage, Strandzhevo village, municipality. Krumovgrad
- BG3G0000aQhMP131 - PS "Krumovgrad" - 3 Kladenetsa, town of Krumovgrad, municipality. Krumovgrad
- BG3G00000NMP026 - Drilling, Sakar Wine House, town of Lyubimets, municipality. Pet
- BG3G0000aQ2MP027 - Well PS, town of Simeonovgrad, municipality Simeonovgrad

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- BG3G0000aQhMP054 – Well, town of Harmanli, municipality. Harmanli
- BG3G000PtPgMP079 - Spring - PS "Kandilka", village of Kandilka, municipality. Krumovgrad
- BG3G00000PgMP067 - Spring, Miladinovo village, municipality. Kardzhali
- BG3G00000PgMP092 - Spring, village of Panichkovo, municipality. Black eyes
- BG3G0000aQ3MP035 - Well - PS, village of Skobelevo, municipality. Dimitrovgrad
- BG3G000000NMP500 - Drilling - new, village of Siva Reka, municipality. Svilengrad
- BG3G000000NMP501 - Drilling, Malko Gradishte village, municipality. Pet
- BG3G0MPG3N1MP167 - Drilling, town of Merichleri, municipality. Dimitrovgrad
- BG3G0000Pg2MP088 - Drilling of KGMR, Haskovo, municipality. Haskovo
- BG3G00000PTMP197 - Drilling, village of Kolarovo, municipality Harmanli
- BG3G00000PTMP198 - Spring "Tales, town of Harmanli, municipality. Harmanli
- BG3G00000PGMP173 - PS "Zvanarka" - Izvor (Capt. №2), village of Zvanarka, municipality. Krumovgrad
- BG3G00000PTMP194 - Drilling, Diamandovo village, municipality. Ardino
- BG3G00000PGMP117 - Well - Angel Tenev House, Velikan village, municipality Dimitrovgrad
- BG3G00000T2MP074 - Slavkov spring, village of Cap. Petko Voivoda, municipality Topolovgrad
- BG3G0000AQHMP144 - Well (NIMH - HGPN№601), town of Kardzhali
- BG3G0000AQHMP053 - Wells - PS-PBV, Momkovo village, municipality. Svilengrad
- BG3G00AHN12MP132 - Drilling - winery, Svilengrad
- BG3G0000PG2MP174 - Drilling, Levka village, municipality. Svilengrad
- BG3G0000APTMP063 - Spring - PS, village of Kamilski dol, municipality. Ivaylovgrad
- BG3G00000PTMP080 - Spring, village of Drangovo, municipality. Kirkovo
- BG3G00000PTMP171 - Spring, village of Kukuryak, municipality. Kirkovo

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- BG3G00000PTMP172 - Spring, Druzhintsi village, municipality. Kirkovo

In 2019 no sampling was performed from a monitoring point with code and name BG3G000000NMP026 - Drilling, Sakar Wine House, town of Lyubimets, municipality Lyubimets, the company owner of the facility has recreated its activities

Characteristics of groundwater bodies (GWP).

The assessment of the chemical status of GWB was performed according to the approach for assessment of the chemical status of groundwater bodies and is given in two categories - good and bad. The approach has been developed in accordance with the requirements of Directive 2000/60/EU, Directive 2006/118/EU for protection of groundwater from pollution and deterioration, Ordinance № 1 for research, use and protection of groundwater, Manual № 18 for the status of groundwater and assessment of trends, Manual №17 for prevention or restriction of direct and indirect discharges and the Manual for Water Framework Directive (WFD) reporting in 2016.

The result of a performed assessment of the chemical status of GWB on the territory of RIEW-Haskovo in 2019 is presented in Table 19:

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Table 19. General assessment of the chemical status of GWB on the territory of RIEW-Haskovo in 2019.

By No	GWB code	Name of GWB	Test: General assessment of the chemical status of GWB (good / bad)	Test: Deterioration of the quality of groundwater intended for drinking water supply (good / bad)	General assessment of the chemical status of GWB	Substances or indicators c observed deviations
1	BG3G00000NQ009	Porous water in Neogene - Quaternary - Haskovo	bad	bad	bad	Iron - 0.245 - 0.777 mg / l Manganese - 0.0525 - 1.0482 mg / l Total alpha activity - 1.2775 Bq / l
2	BG3G000000Q010	Porous water in the Quaternary - Arda river	good	good	good	
3	BG3G000000Q012	Porous water in the Quaternary - Maritsa Iztok	bad	bad	bad	Manganese - 0.4886 mg / l
4	BG3G000000Q013	Porous water in the Quaternary - Upper Thracian lowland	bad	bad	bad	Manganese - 0.2656 mg / l Phosphate - 1.35 mg / l
5	BG3G00000NQ018	Porous water in Neogene - Quaternary - Pazardzhik - Plovdiv region	There are no monitoring points from the national network for monitoring the chemical status of groundwater for monitoring on the	There are no monitoring points drawing water for drinking and domestic water supply on the territory of RIEW - Haskovo	bad	Nitrates - 58.5 mg / l Phosphates - 0.6875 mg / l Total alpha activity - 0.9133 - 0.9775 Bq / l

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By No	GWB code	Name of GWB	Test: General assessment of the chemical status of GWB (good / bad)	Test: Deterioration of the quality of groundwater intended for drinking water supply (good / bad)	General assessment of the chemical status of GWB	Substances or indicators c observed deviations
			territory of RIEW-Haskovo			
6	BG3G000000Q052	Porous water in the Quaternary - Svilengrad - Stambolovo	good	good	good	
7	BG3G000000NQ054	Porous water in Neogene - Quaternary - Yambol - Elhovo	There are no monitoring points from the national network for monitoring the chemical status of groundwater for monitoring on the territory of RIEW-Haskovo	There are no monitoring points drawing water for drinking and domestic water supply on the territory of RIEW - Haskovo	bad	Nitrates - 57 mg / l Phosphates - 0.635 mg / l Total alpha activity - 1,015 Bq / l
8	BG3G000000N053	Porous water in Neogene - Svilengrad - Stambolovo	good	good	good	
9	BG3G0000PgN019	Porous water in Paleogene - Neogene - Maritsa iztok	bad	There are no monitoring points drawing water for drinking and domestic water	bad	Nitrates - 200.5 mg / l Sulfates - 370 mg / l Arsenic - 0.012 mg / l

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By No	GWB code	Name of GWB	Test: General assessment of the chemical status of GWB (good / bad)	Test: Deterioration of the quality of groundwater intended for drinking water supply (good / bad)	General assessment of the chemical status of GWB	Substances or indicators c observed deviations
				supply on the territory of RIEW - Haskovo		
10	BG3G0000Pg2055	Cracked water - Svilengrad massif	good	good	good	
11	BG3G0000PgN026	Karst water - Chirpan - Dimitrovgrad	good	There are no monitoring points drawing water for drinking and domestic water supply on the territory of RIEW - Haskovo	good	
12	BG3G00000K2030	Cracked water - Brezovsko - Yambol zone	There are no monitoring points from the national network for monitoring the chemical status of groundwater for monitoring on the territory of RIEW-Haskovo	There are no monitoring points drawing water for drinking and domestic water supply on the territory of RIEW - Haskovo	good	

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By No	GWB code	Name of GWB	Test: General assessment of the chemical status of GWB (good / bad)	Test: Deterioration of the quality of groundwater intended for drinking water supply (good / bad)	General assessment of the chemical status of GWB	Substances or indicators c observed deviations
13	BG3G0000T12034	Karst water - Topolovgrad massif	bad	bad	bad	Nitrates - 51 mg / l
14	BG3G00000Pt045	Cracked water - Shishmanovo - Ustremski massif	good	good	good	
15	BG3G000PtPg049	Cracked water - Eastern Rhodope complex	bad	bad	bad	Iron - 0.2953 mg / l

Note: The overall assessment determines the "poor" chemical status of GWB BG3G00000NQ018 and BG3G00000NQ054 on the territory of the EABD for 2019 and "good" chemical condition of GWB BG3G00000K2030 for 2019.

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3.4.4. LANDS AND SOILS

3.4.4.1. TERRITORIAL INFORMATION FROM RIEW

The total territory controlled by RIEW-Haskovo is about 826344 ha, where the agricultural lands are 440413 ha and the forest area is 348426 ha.

3.4.4.2. SOIL CONTAMINATION WITH HEAVY METALS AND METALLOIDS

RL-Haskovo carries out the monitoring activity in the monitoring and control points of the subsystem "Lands and soils" of NASEM. The points where the soil sampling is performed are determined by the EEA, Sofia and are 30pcs. They are located on the entire territory of the RIEW and depend on the sources of pollution. The points are determined according to the type of soil, the way of permanent use and the crops used. They are determined by geographical coordinates, which form a network of 16x16 km from each other.

In 2017, soil samples were tested for analysis of soils contamination with heavy metals and metalloids level I. There were taken 60 samples from the checkpoints - village of Sirakovo, municipality of Haskovo, village of Gorski izvor, municipality Dimitrovgrad, village of Manastir, municipality Haskovo, Uzundzhovo village, municipality Haskovo, village of Golyamo Asenovo, municipality Dimitrovgrad, Razhenovo village, municipality Madzharovo, village of Slavyanovo, municipality Harmanli, village of Kalugerovo, municipality Simeonovgrad, the village of Yakovitsa, municipality Krumovgrad and the village of Patitsa, municipality Chernoochene. Exceedances of the maximum allowable concentrations for the indicators chromium and nickel for the village of Yakovitsa and nickel for the village of Patitsa have been established.

In 2018, soil samples were tested for analysis of soils contamination with heavy metals and metalloids level I. There were taken 54 samples from the checkpoints - Petlino village, municipality. Momchilgrad, village of Tatul, municipality Momchilgrad, Yakovitsa village, municipality Krumovgrad, village of Ralitsa, municipality Momchilgrad, village of Kokiche, municipality Kardzhali and the village of Strazhets, municipality Kardzhali.

In 2019, soil samples were tested for analysis of soils contamination with heavy metals and metalloids level I. There were taken 90 samples from the checkpoints - Petlino village, municipality. Momchilgrad, the village of Tatul, the municipality of Momchilgrad, the village of Yakovitsa, the municipality of Krumovgrad, the village of Ralitsa, municipality of Momchilgrad, village of Kokiche, municipality Kardzhali and the village of Strazhets, municipality Kardzhali. The results of the analyzes show an exceedances of the concentration of chromium in the village of Petlino, Momchilgrad municipality – value of 440 mg/kg and the village of Yakovitsa, Krumovgrad municipality – value of 325 mg/kg, at a norm of 250 mg/kg.

The annual monitoring shows that the soils in the region are in good ecological condition in terms of nutrient reserves / organic matter, estimated by measured concentrations of total nitrogen, organic carbon and total phosphorus, and the C / N ratio shows favorable conditions for decomposition / mineralization of organic matter.

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3.4.4.3. CONTAMINATION OF SOILS WITH PLANT PROTECTION PRODUCTS (PESTICIDES)

In recent years, the territory controlled by RIEW-Haskovo contains about 662,379 kg in solid and 84,000 liters in liquid state of banned pesticides.

There are 14 pcs. warehouses for obsolete and prohibited for use plant protection products, 9 centralized warehouses for storage of PPP and 2 storage sites for 24pcs. and 8 pcs. BB - Cubes in the Municipality of Ivaylovgrad and Svilengrad.

In 2017 were conducted 26 scheduled inspections of warehouses for storage and use of storage of obsolete pesticides and 7 unplanned inspections. In 2018 a total of 37 inspections of warehouses for storage of obsolete pesticides were carried out. In 2019 a total of 41 inspections of warehouses for storage of obsolete pesticides were carried out.

In order to finally solve the problems with the warehouses and the plant protection products available in them, which create a potential danger of accidents and environmental pollution, is being implemented the project "Environmentally friendly disposal of obsolete pesticides and other plant protection products with expired expiration". The project is funded under the "Bulgarian-Swiss Cooperation Program". It includes 23 warehouses on the territory of RIEW-Haskovo.

In 2019, according to this project, were liquidated warehouses for storage of unusable pesticides in the village of Gorski Izvor, municipality of Dimitrovgrad and the village of Stoykovo, Haskovo municipality.

Soil monitoring for soil contamination with pesticides is carried out on the controlled territory. The points are determined by the EEA - Sofia. The analyzes are performed in RL – Haskovo, branch of the EEA. During the period 2017 and 2018, no soil contamination with pesticides was found.

During the implementation of the Soil Monitoring Program level I, in 2019, was performed sampling and testing of soil samples for analysis of pesticide pollution, in 6 points - in the village of Petlino, Momchilgrad municipality; Kokiche village, Kardzhali municipality; Tatul village, Momchilgrad municipality; Strazhets village, Kardzhali municipality; Yakovitsa village, Krumovgrad municipality; Ralitsa village, municipality Momchilgrad. There were performed 54 analyzes. According to the results from the analyzes no exceedances of pesticide content in the soils have been registered.

3.4.4.4. SOIL POLLUTION WITH PERSISTENT ORGANIC POLLUTANTS, INCL. PETROLEUM PRODUCTS

Pollution is mainly due to accidents or accidental spills and leaks in oil storage facilities. In 2019 on the territory of RIEW - Haskovo pollution with oil products has not been found.

3.4.4.5. SOIL EROSION

For the regions of Haskovo and Kardzhali over 150 thousand decares have been subjected to increased water erosion. The affected lands are mainly in the Kardzhali region (municipalities of Kardzhali, Momchilgrad, Krumovgrad, Chernoochene, Kirkovo).

To a large extent, the active water erosion in the Kardzhali region has been reduced and controlled by the large-scale afforestation carried out in recent years - more than 1 million decares of new forests have been afforested and anti-erosion technical measures have been carried out.

In the plain part of the region, the Upper Thracian plain, along the Maritsa river and on slightly

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sloping foothills of the Eastern Rhodopes, water erosion is less pronounced due to the natural grassing and self-afforestation of the uncultivated lands.

During the period 2017-2019, no projects against erosion have been financed and there is no information about such projects to be implemented on the territory controlled by the RIEW - Haskovo. The activities for prevention of soil erosion are mainly financed by the Ministry of Agriculture and Food.

3.4.4.6. SALINIZATION AND ACIDIFICATION OF SOILS

During the implementation of Soil Monitoring Programs for 2017, soil sampling and testing for acidification analysis was performed, including 8 samples from: point in the town of Lyubimets, the village of Tankovo, the municipality of Stambolovo, the village of Konstantinovo, the municipality of Simeonovgrad and Tsareva polyana municipality Stambolovo, 16 analyzes were performed. The results of the analyzes show that no harmful soil acidity have been registered.

During the implementation of Soil Monitoring Programs for 2018, soil sampling and testing for acidification analysis was performed, including 4 samples from a point in the town of Lyubimets, the village of Tankovo, the municipality of Stambolovo, the village of Konstantinovo, the municipality of Simeonovgrad and Tsareva polyana, municipality of Stambolovo, 32 analyzes were performed. The results of the analyzes show that no harmful soil acidity have been registered.

During the implementation of the Soil Monitoring Program for 2019, sampling and testing of soil samples for acidification analysis was performed, including 4 samples from a point in the town of Lyubimets, the village of Tankovo, the municipality of Stambolovo, the village of Konstantinovo, the municipality of Simeonovgrad and Tsareva polyana, municipality of Stambolovo, 32 analyzes were performed. The results of the analyzes show that no harmful soil acidity have been registered.

On the territory of RIEW - Haskovo there are no soil points for monitoring the soils from salinization.

3.4.4.7. UNREGULATED DUMPING OF WASTE ON THE SOIL SURFACE (CONSTRUCTION, DOMESTIC, INDUSTRIAL AND AGRICULTURAL WASTE)

The dumping of various types of wastes on the soil surface in the settlements and outside them continues. As a result of conducted planned and extraordinary inspections and given prescriptions in 2019, 74 pcs unregulated landfills were closed.

3.4.5. ANALYSIS OF THE IMPACTS FROM THE FACTORS

3.4.5.1. WASTE

Separate waste collection

In the municipalities of Haskovo, Dimitrovgrad, Svilengrad, Lyubimets, Momchilgrad and Kardzhali, have been implemented and functioning systems for separate collection of waste for packaging on the basis of concluded contracts with recovery organizations. Harmanli Municipality has introduced an independent system for separate collection of domestic waste and waste from packaging from

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the population. Two smaller municipalities with settlements of more than 5,000 inhabitants have not yet introduced separate waste collection systems.

For the fulfillment of the obligations for separate collection of the waste from packaging on the territory controlled by the inspection, separate collection systems have been introduced and are serviced by recovery organizations in six municipalities - Dimitrovgrad, Haskovo, Kardzhali, Svilengrad, Momchilgrad and Lyubimets. In the municipalities of Dimitrovgrad, Haskovo, Svilengrad and Lyubimets, systems for separate collection of waste from packaging have been introduced on the basis of concluded contracts. Systems for separate collection of other groups of widespread waste (End-of life vehicles, WEEE, NUBA) are not introduced by the municipalities, and their functions are now performed by the business. Each company that has constructed the relevant site for the treatment of these waste streams decides whether to conclude a contract with one of the recovery organizations or directly with individuals for final utilization/deposition of waste.

Domestic waste

The regional associations of the municipalities in Haskovo region operate two facilities for solid waste disposal - in the land of Garvanovo village, Haskovo municipality, which serves the municipalities of Haskovo, Dimitrovgrad and Mineralni Bani and in the land of Harmanli, serving the municipality. Harmanli, Lyubimets, Stambolovo, Svilengrad, Madzharovo, Simeonovgrad and Topolovgrad.

On the territory of the landfill near the village of Garvanovo, municipality Haskovo operates facilities for composting "green" waste and an installation for separation of domestic waste with the production of RDF - fuel from waste. The capacity of the separation installation is the treatment of a minimum of 35,000 t / y of domestic waste, or more than half of the transported quantities for disposal.

There is also a separation installation for domestic waste on the territory of the landfill for solid waste in Harmanli. The capacity of the facility is over 25,000 t / year in one-shift operational regime of work. In 2019 The municipalities of Harmanli and Svilengrad started the construction activities under the project "Construction of a municipal facility for composting green and biodegradable waste" under Procedure № BG16M10P002-2.005 "Design and construction of composting plants for separately collected green and / or biodegradable priority waste" under Operational Program "Environment 2014-2020".

On the territory of the RIEW in Kardzhali region is located a Regional landfill for non-hazardous waste for the municipalities of Kardzhali, Ardino, Dzhebel, Ivaylovgrad, Kirkovo, Krumovgrad, Momchilgrad and Chernoochene. The landfill does not yet have a facility for pre-treatment of incoming domestic waste, which is why recyclable materials are not separated before disposal. In 2019, a facility for mechanical biological treatment of "green" waste was installed, which is still not working.

In 2019 in all 17 municipalities were carried out inspections for the establishment of pollution with waste on the riverbeds and their adjacent territories, in connection with the control of certain prescriptions for organizing their cleaning in case of established ones. During the inspections it was established that it is not allowed to disposal of domestic and construction waste in the river beds and on their banks, passing through the settlements.

RIEW-Haskovo carries out control in all municipalities by settlements for the presence of unregulated landfills, regarding a letter from the MoEW. Instructions were given to 12 municipalities (Dimitrovgrad, Harmanli, Simeonovgrad, Mineralni Bani, Momchilgrad, Stambolovo, Kardzhali, Ivaylovgrad, Topolovgrad, Haskovo, Svilengrad and Lyubimets) for cleaning the established

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unregulated landfills.

According to the annual environmental report of a regional landfill in the village of Garvanovo in the period January-December 2019, were disposed 31,803.67 tons of solid waste in cell I, and the distribution by municipalities is as follows: 11340,248 tons of Dimitrovgrad Municipality, 1373,355 tons from the Municipality of Mineralni Bani and 19,090,067 tons from the Municipality of Haskovo. The acceptance of the waste on the landfill is based on pre-specified schedule and an accepted application by the holder of the waste and on the basis of a written contract. In 2019, after preliminary treatment in the separating installation were separated and handed over for utilization 648,821 tons of paper and cardboard, RDF fuel - 6011,170 tons, 619,09 tons of plastic and rubber, 34,968 tons of glass, 25,670 tons of color metals and 232,201 tons of ferrous metals.

According to the annual environmental report submitted by the operator of the Harmanli landfill, a total of 14,443,800 tons of solid waste were disposed of last year. The quantity by municipalities is as follows: 5202,361 t - from Harmanli Municipality; 1145,828 tons - from the Municipality of Lyubimets; 264,182 tons - from the Municipality of Madzharovo; 4189,553 tons - from the Municipality of Svilengrad; 1384,097 tons - from the Municipality of Simeonovgrad; 826,281 tons from the Municipality of Stambolovo; 1431,498 tons - from the Municipality of Topolovgrad. The acceptance of the waste takes place according to a pre-specified schedule and accepted application with the owner of the waste and on the basis of a written contract. In 2019, 19,250.82 tons were accepted at the separation installation, of which: 202,580 tons of paper and cardboard, 362.96 tons of polymeric materials (packaging), 80.48 tons of ferrous and non-ferrous metal waste and 68, 8 tons of waste glass.

According to the annual environmental report submitted by the operator of the landfill in Kardzhali in 2019, a total of 35,749.14 tons of solid waste were disposed of. The quantity by municipalities is as follows: Municipality of Kardzhali - 21197.08 tons; Municipality of Ardino - 2351.42 tons; Municipality of Krumovgrad - 2875.69 tons; Kirkovo Municipality - 4238.00 tons; Momchilgrad Municipality - 3138.41 tons; Municipality of Jebel - 1705.94 tons. and the Municipality of Ivaylovgrad - 242.60 tons. The acceptance of the waste takes place according to a pre-specified schedule and an accepted application with the owner of the waste and on the basis of a written contract.

On the territory of RIEW-Haskovo there is only one facility for treatment of "green" waste, which is used by the municipalities of Haskovo, Dimitrovgrad and Mineralni Bani. In these municipalities, the separate collection and storage of "green" waste is organized by placing "brown" containers, which are serviced by specialized vehicles.

Construction waste:

On the territory of RIEW - Haskovo there are no facilities for construction waste treatment. The generated construction waste is disposed of in places determined by the mayors of the municipalities. During the year there was no utilization of construction waste from demolition of old buildings by mobile facilities.

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3.5. CONCLUSIONS:

3.5.1. BLAGOEVGRAD REGION

1. According to the Executive Environment Agency (EEA), in recent decades agriculture has put significant pressure on natural resources in Bulgaria mainly through the applied chemical fertilizers and plant protection products used in tillage. On the other hand, both intensive agriculture and non-management of land have negative effects on the environment.
2. The main air pollutants emitted by agriculture are ammonia (NH₃) and non-methane volatile organic compounds (NMVOC). Agriculture is the largest source of ammonia, emitting 84% of national ammonia emissions; the share of emissions of non-methane volatile organic compounds in relation to national emissions of this pollutant is 9%.
3. Taking into account the data from the analyzes of QAA for the period 2017, 2018. and 2019 for the first time in 2019 the air quality is not violated by the PM₁₀ indicator.
4. Gasification of the whole area will reduce emissions of harmful substances released into the ground layer by combustion processes in industry and in the home.
5. In 2019 on the territory controlled by RIEW-Blagoevgrad are covered for current control, including by obliging to conduct self- monitoring all major fixed sources of emissions. No significant exceedances of the emission limit values were found for industrial sources.
6. Предвид резултатите от провеждания почвенмониторинг по широк спектър от показатели провежданите дейности от страна на РИОСВ Благоевград, включващи превантивен, текущ и последващ контрол по всички компоненти на околната среда и фактори които и влияят, структурата и обемите на производство в региона, възраждане на земеделието в последните години, дават основание да се даде положителна оценка за състоянието на почвите в териториалния обхват на РИОСВ – БлагGiven the results of soil monitoring on a wide range of indicators activities carried out by RIEW Blagoevgrad, including preventive, ongoing and follow-up control of all components of the environment and factors that affect it, the structure and production volumes in the region, the revival of agriculture in recent years, give grounds to give a positive assessment of the condition of the soils in the territorial scope of RIEW - Blagoevgrad.
7. According to data from RIEW Blagoevgrad on the basis of the given prescriptions during the inspections carried out in 2019, the companies start to fulfill the requirements of the WMA and the bylaws - classify the waste generated by their activity, conclude contracts for their transfer with persons authorized for activities with waste, keep records of the quantities of generated and delivered waste.
8. Checks were carried out for the presence of unregulated pollution with waste within the scope of the national road network, controlled by RIEW-Blagoevgrad. Waste pollution is most often found at road junctions and recreation areas. Pollution is mainly from packaging waste. Prescriptions with specific deadlines for implementation have been set, and subsequent control has been

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carried out.

9. With the operation of the "Regional Waste Management System (RWMS), Blagoevgrad Region, serving municipalities: Blagoevgrad, Simitli, Rila, Kocherinovo and Boboshevo - Phase I", including Cell 1, the problem of municipal waste of municipalities is to be solved, participating in the regional association

3.5.2. SMOLYAN REGION

1. By the 2019 on the territory of RIEW - Smolyan, no soil contamination with persistent organic pollutants, including petroleum products and / or expired plant protection products, has been reported. The data from the conducted soil monitoring show that for the most part the indicators are within the MAC, and for some results even much below the admissible norms.
2. As a result of the intensified control carried out by the RIEW - Smolyan regarding waste management and prevention of unregulated disposal, in 2019 there is strict compliance with the instructions given by the inspection for cleaning riverbeds and adjacent areas from unregulated pollution.
3. The control over the observance of the conditions in the permits for waste treatment at the sites for collection and treatment of ELVs, WEEE, NUBA, HW continues.
4. Intensified control was carried out against the unregulated incineration of waste during the inspections of car repair shops, sewing companies, tire change sites, second-hand clothing stores, furniture production, etc. Most of the sites have performed waste classification and keep records in accordance with the requirements of Ordinance № 1/2014 on the procedure and templates for providing information on waste activities, as well as the procedure for keeping public registers.
5. On the territory of RIEW - Smolyan, the persons placing on the market products, after the use of which widespread waste is generated, fulfill their obligations through a collective system, represented by recovery organizations, or by paying a product fee in the EMEPA. On the territory of the inspection there are no persons performing their duties individually (art. 14, para 1 of the WMA).
6. Sustainability of the waste management results concerning the activities for cleaning and prevention of unregulated landfills, storage, collection, transportation and treatment of industrial and hazardous waste has been achieved.

3.5.3. HASKOVO AND KARDZHALI REGIONS

1. As a result of the implementation of the environmental legislation regarding the sources of air pollution in the period from 2017 to 2019, there is a decrease in the average annual concentration of PM10. In 2019 the measured average annual concentrations of PM10 are lower than the average annual norm of 40 µg/m³. Compliance with the regulatory requirements for air quality in the towns of Dimitrovgrad and Kardzhali has been achieved, and minimal non-compliance with the town of Haskovo, which should be maintained and supported by additional measures in 2020.
2. By 2019, all enterprises - sources of air emissions in the region of Dimitrovgrad already

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comply with norms for admissible emissions, and in Kardzhali minimal exceedances are found only for 2 sites. As a result, permanent compliance with the standards for air quality in both regions in terms of pollution from industrial sources has been achieved.

TASK 4. SURVEY ON THE AWARENESS OF YOUNG OWNERS OF SMALL AND MEDIUM ENTERPRISES (SMES) ABOUT THE ENVIRONMENTAL PROBLEMS RELATED TO THE ACTIVITY OF THEIR ENTERPRISES

4.1. PURPOSE OF THE STUDY

The survey is conducted to study and analyze the awareness of young farmers about the existing environmental problems in their farms, as well as in the agricultural sector in the regions of Blagoevgrad, Smolyan, Kardzhali and Haskovo.

Some of the respondents will have the opportunity to apply research and design research on their farms in order to apply more environmentally friendly practices. In addition, farmers will have the opportunity to exchange experiences with colleagues and scientists from Bulgaria and Greece, as well as to participate in free two-week training in Bulgaria related to the EMS system, which is being developed within the project. Selected farmers will have the opportunity to participate free of charge in a study visit to similar farms in Greece.

The survey was conducted through a quantitative survey conducted by telephone in the period 07.09.2020. - 10.10.2020

4.2. TARGET GROUP

The quantitative survey involved 50 respondents, owners of agricultural holdings in the regions of Blagoevgrad, Smolyan, Haskovo and Kardzhali. The respondents are aged 20 to 40 years, and there is no significant difference in the number of young people in the group from 21 to 30 years. (19) and in the one from 31 to 40 years. - 22.

The study included 24 crop farms, 15 livestock farms, 4 mixed farms, two crop farms with beekeeping, two livestock farms with beekeeping and one entirely focused on beekeeping.

4.3. RESULTS OF THE RESEARCH

The interest of the respondents in environmental protection is unanimous, but only 20% of the respondents have taken or plan to take measures to overcome the negative consequences of the environmental problems. Among the most frequently mentioned measures are the waste collection, composting, drilling, leveling and replenishment of soils in heavy rains.

The share of those interested in national policies related to the implementation of agri-environmental measures is three times higher than those who are not (76% to 24%). The most preferred method of informing on the issue of the application of agri-environmental measures is the online media (88%), followed by the websites of state institutions (44%) and relatives, friends, colleagues (nearly 38%). The print media is the least used information channel.

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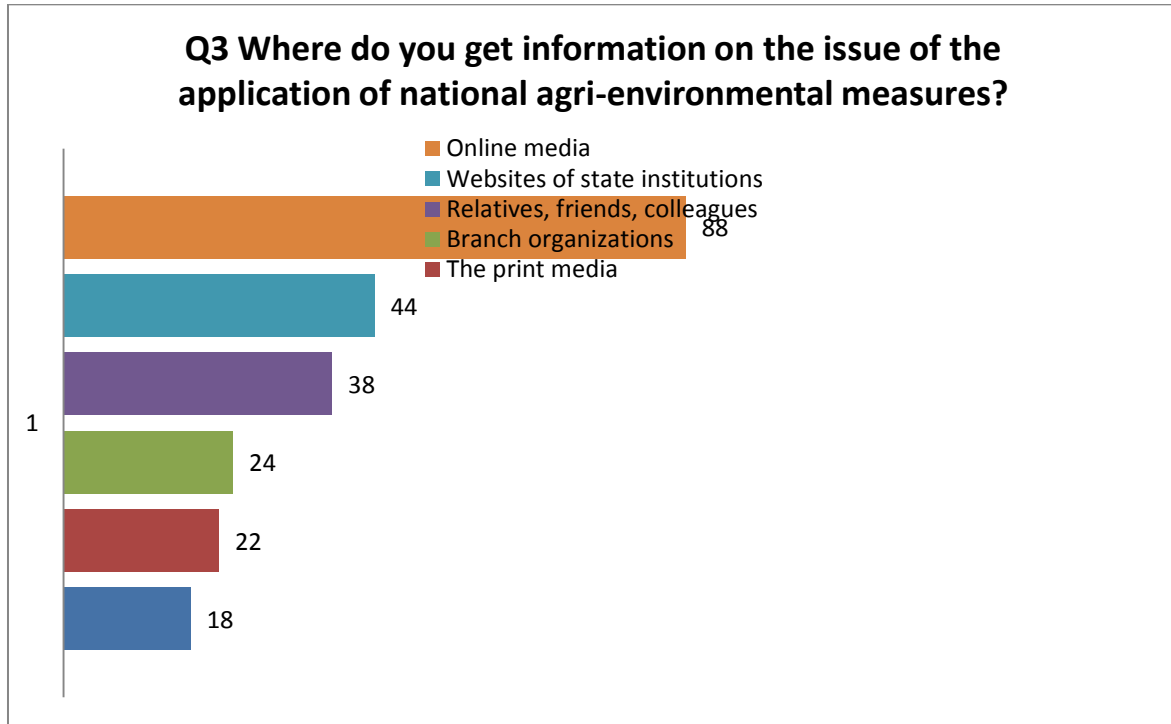


Figure 18

The prevailing opinion is that there is no unresolved environmental problem in the areas under consideration (46%). Another part of the respondents most often point to the lack of water for irrigation or production purposes as a problem (44%). According to farmers, waste disposal or treatment is also a difficulty (16%).

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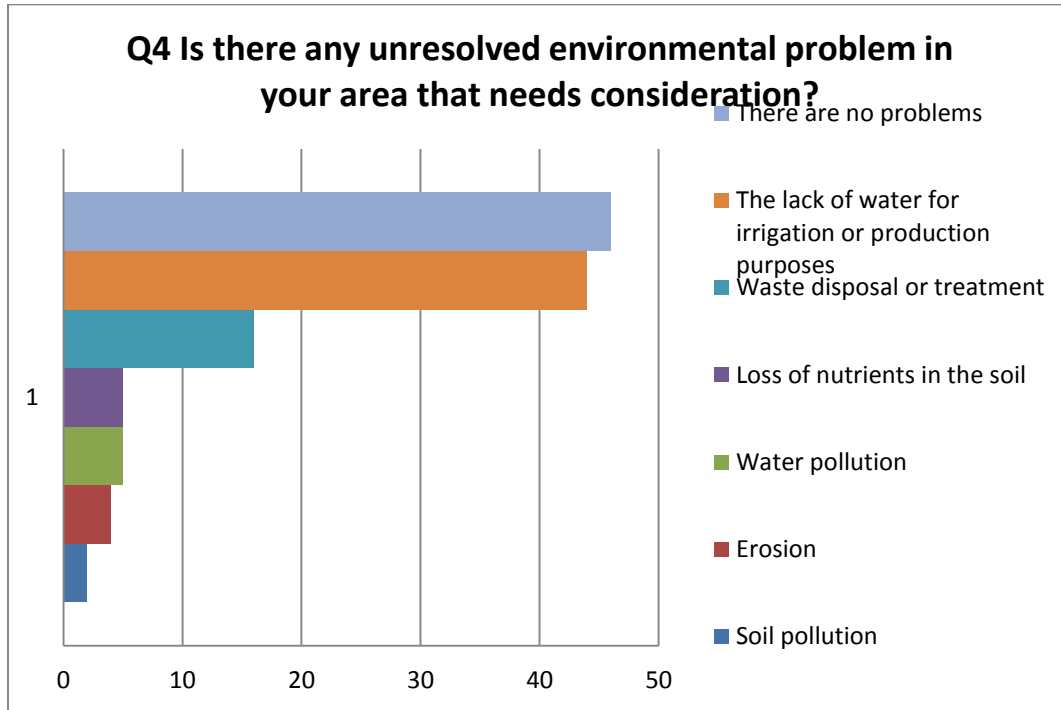
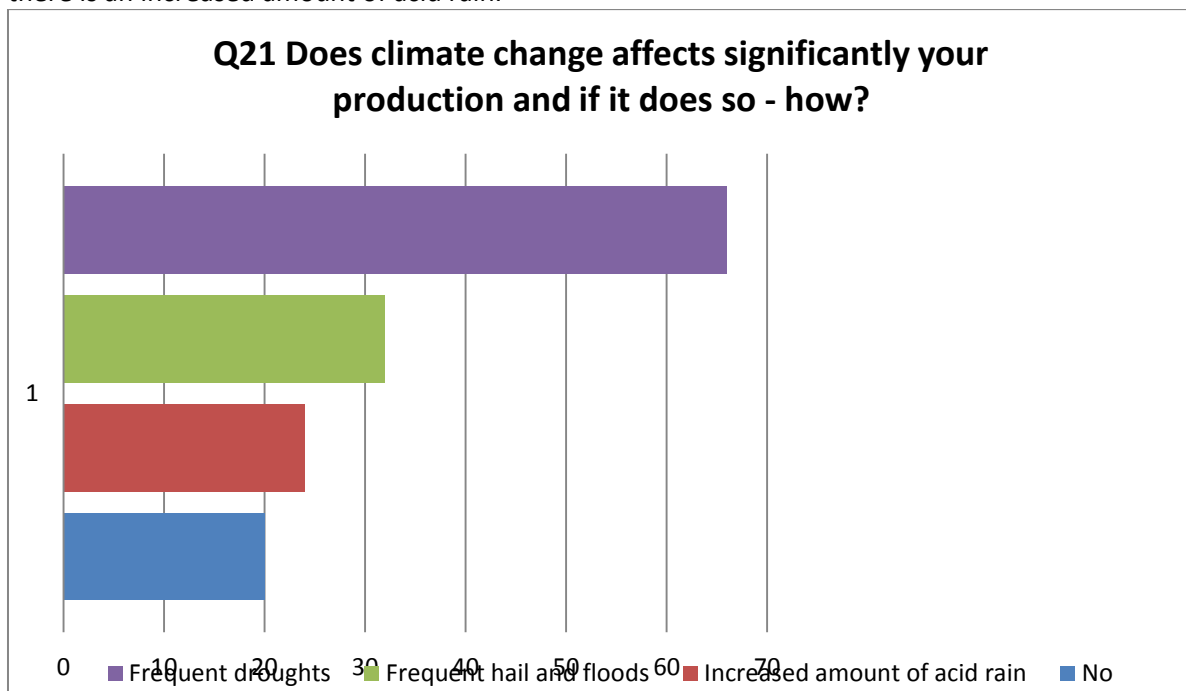


Figure 19

As the most serious problem due to climate change, which affects the production of respondents, 66% of farmers cite frequent droughts, 32% focus on frequent hail and floods, and 24% believe that there is an increased amount of acid rain.



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Figure 20

72% of the surveyed farmers apply agri-environmental practices as 55.5% of them use less pesticides and fertilizers, and nearly 39% have switched to organic farming. Observance of the required crop rotation, as well as the application of less intensive agricultural practices than before are also indicated as preferred agri-environmental measures.

In the farms of those who took part in the survey, the implementation of activities from the circular economy is rare. Of the positive respondents, the most common practice is the use of manure from animals - 7 pcs., Other actions are in the direction of processing products, composting, collecting rainwater, reuse of beeswax.

Regarding the balanced or controlled application of nutrients in the soil, 20 out of 24 growers claim that they calculate the amounts of nutrients and do not put more than necessary, with those from mixed farms using only manure.

Of the respondents, a total of 24 take action to enrich the soil. Among the most commonly chosen methods are by crop rotation (8), with manure (7), and the enrichment with artificial, the planting of alfalfa and roof crops are poorly mentioned. The other five gave a positive answer, but did not specify the method of soil enrichment. Two owners rarely do it, and fifteen do not do it at all.

Only 26% of farmers use water, solar or bio energy on their farms and solar energy is among the most common responses to energy efficiency.

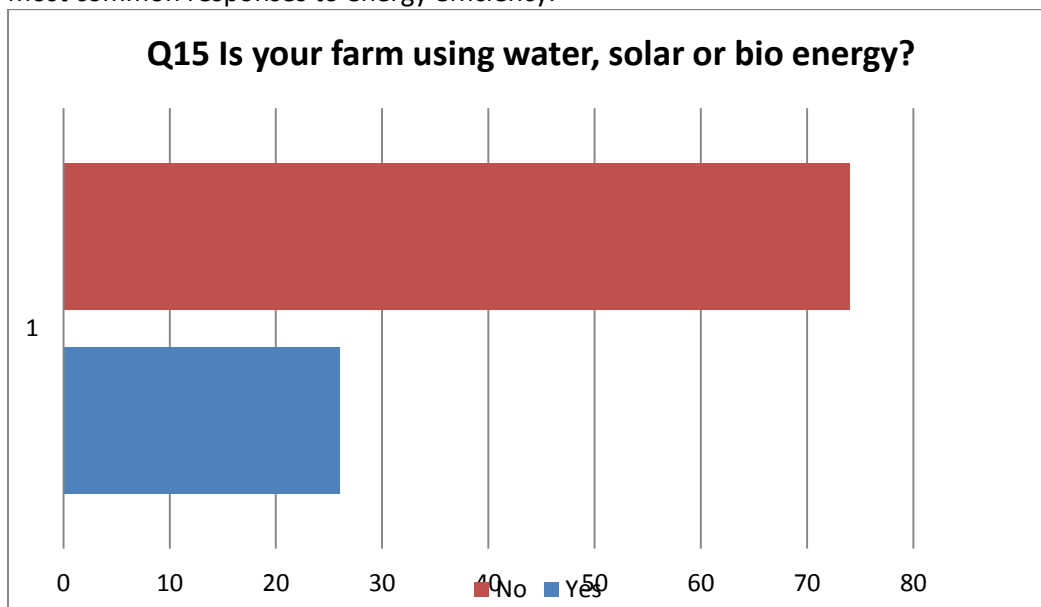


Figure 21

In five farms electric shepherds / energizers with solar blocks are applied, in three solar panels for lighting are built. Five of the respondents share that they have the desire and plan to introduce energy efficient sources in their farms.

Regarding the replacement of the car and / or machine park of the farmers with one with more ecological fuel, the negative attitude prevails - 58%, and the positive ones are 42%.

The type of irrigation in agriculture can be divided into two types - with an underground water source, which includes wells, pumps, wells - a total of 7 farmers and from surface water bodies,

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where the main sources are rivers (2), dams (4), micro-dams (2), irrigation canals (4), rainwater (8). Ten more respondents indicated that they irrigate their crops superficially, but did not specify the source of the water.

In very rare cases, farmers use running water as a method of watering.

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4. 4. CONCLUSIONS

The following conclusions can be drawn from the study:

- All respondents are interested in environmental protection;
- Almost 80% of the young farmers follow national policies related to the implementation of agri-environmental measures;
- The most preferred information channel for this purpose is the online media;
- Over 70% of the respondents apply agri-environmental measures on their farms;
- The most commonly applied measures are the limited use of pesticides and fertilizers, as well as the transition of some farmers to organic farming;
- Among young farmers there is a lack of familiarity with the circular economy and, accordingly, the inability to apply its typical practices;
- Soil enrichment occurs through crop rotation and fertilization with natural fertilizers;
- The number of farmers using solar, wind or bio energy is very low. The surveys indicate the use of solar energy only - in five cases it is for electricians and in three more - for lighting;
- The idea of replacing the car / machine park in the farms with those with more environmentally friendly fuel met with a negative response among almost 60% of the respondents;
- Water scarcity is emerging as a major problem for growers, while drought has been identified as the most serious problem due to climate change;
- The practice of constructing water wells is rare.

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**TASK 5. RESEARCH AND PREPARATION OF A CATALOG OF GOOD PRACTICES FOR
ENVIRONMENTAL MANAGEMENT OF SMALL AND MEDIUM ENTERPRISES IN THE
AGRICULTURAL SECTOR.**

5.1. ESSENCE AND PRINCIPLES IN ENVIRONMENTAL MANAGEMENT IN AGRICULTURE

Agroecology studies the ecological processes that are observed in agricultural production systems. The formulation of ecological principles in agro-ecosystems offers new management approaches that ensure the achievement of sustainable economic development by improving human well-being, taking into account the impact of agricultural practices on the components of the environment.

The Food and Agriculture Organization (FAO) formulates 10 basic principles of agri-environment that should be used as a guide for policymakers, practitioners and stakeholders in the planning, management and evaluation of agri-environmental processes.

Diversity: diversification is the key to agri-environmental transitions to ensure food security and food, while preserving, protecting and increasing natural resources. Agri-environmental systems are very diverse. From a biological point of view, agroecological systems optimize the diversity of species and genetic resources in different ways.

Co-creation and sharing of knowledge: Agricultural innovation responds better to local challenges when they are co-created through participatory processes. Agri-environmental practices are tailored to the environmental, social, economic, cultural and political context in each country. The joint creation and sharing of knowledge plays a central role in the process of developing and implementing agri-environmental innovations to address the challenges of food systems, including adaptation to climate change.

Synergies: building synergies strengthens key functions in food systems, supports production and many ecosystem services. Agri-environment pays particular attention to the design of a variety of systems that selectively combine annual and perennial crops, livestock and aquatic animals, trees, soils, water and other components of farms and the agricultural landscape to improve synergies in the context of increasingly changing the climate.

Efficiency: innovative agri-environmental practices generate more output using fewer external resources. Increased resource efficiency is a requirement in agri-environmental systems, which carefully plan and manage diversity to create synergies between the various components of the system. For example, a key efficiency challenge is that less than half of the nitrogen fertilizers added globally to arable land are converted into "manufactured products" and the rest is lost to the environment, causing major environmental problems.

Recycling: more recycling means agricultural production with lower economic and environmental costs. By mimicking natural ecosystems, agri-environmental practices support biological processes that stimulate the recycling of nutrients, biomass and water within production systems, thus increasing resource efficiency and minimizing waste and pollution.

Resilience: Increased resilience of people, communities and ecosystems is key to sustainable food and agricultural systems. Diversified agri-environmental systems are more resilient - they have a greater ability to recover from disturbances, including extreme weather events such as droughts, floods or hurricanes, and to withstand pest and disease attacks. Agri-environmental approaches can also improve socio-economic sustainability / flexibility. Through diversification and integration, producers reduce their vulnerability if a single crop, animal species or other commodity fails.

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Human and social values: the protection and improvement of rural nutrition, equality and social welfare are essential for sustainable food production and agriculture systems. Agri-environment places a strong emphasis on human and social values such as dignity, justice, inclusion and equity, which contribute to improving lifestyles.

Culture and food traditions: by supporting healthy, diversified and culturally appropriate diets, agri-environment contributes to food security while preserving the health of ecosystems.

Responsible governance: Agri-environment calls for responsible and effective governance in support of the transition to sustainable food and agricultural systems. Transparent, accountable and inclusive management mechanisms are needed to create an enabling environment to help producers transform their agricultural practices. Successful examples include school meals and public procurement programs, market regulations allowing the labeling of differentiated agri-environmental products and subsidies, and incentives for ecosystem services.

Circular economy and solidarity: Circular and solidarity-based economies, which connect producers and consumers, provide innovative solutions in support of resource efficiency, while providing a social basis for inclusive and sustainable development. Agri-environmental approaches promote solutions based on local needs, resources and capacity, creating fairer and more sustainable markets. Strengthening short food chain schemes can increase food producers' incomes while maintaining a fair price for consumers.

5.2. ECOLOGICAL PRINCIPLES OF ORGANIC PRODUCTION

The spread of the Western model of high-productivity agriculture in developing countries creates further technological and cultural dependence, as well as problems typically related to the Western system of production. Developing countries have become importers of the same chemicals, the sale of which is already banned in industrialized countries. This leads to side effects on: water due to irrigation; soil erosion; the use of pesticides and antibiotics.

Organic farming is subject to universal principles, which are:

- ✓ **Principles of the biosystem** - Organic farming must maintain and increase the fertility of the soil, plants, animals and people as a whole.
- ✓ **Principle of ecology** - Organic farming must be based on vital ecological systems and cycles, work with them and help maintain them.
- ✓ **Principle of honesty** - Organic farming must be built on interconnections that ensure honesty about the nature of living relationships.
- ✓ **Principle of care** - Organic farming must be managed with caution in order to protect the health and well-being of present and future generations and the environment.

The basic principles of organic production are the following:

- To consider the farm as a system or "organism" that exists in the context of a local ecosystem;

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- To maintain the balance in the relationships within the farming system itself, as well as those between the farming system and the surrounding ecosystem;
- To maintain a certain degree of biodiversity in the system;
- To stimulate the biological cyclicality of the system;
- To get the maximum benefit from solar energy and to reduce the use of all types of external investments to the absolute minimum;
- To maintain relations with the surrounding ecosystem;

Pointing these basic principles we can consider the specific farming techniques:

- ✓ To grow crops and species that are most suitable for the local environment;
- ✓ Peripheral areas and forest lands should be maintained and improved;
- ✓ To improve the biodiversity of the system;
- ✓ Species to act as a buffer against winds and to prevent erosion;
- ✓ The farm should have minimal impact on the rural landscape, even improve it;
- ✓ To reduce soil compactness and erosion;
- ✓ To increase the humus content;
- ✓ Crop rotation;
- ✓ Mechanical and physical means;
- ✓ Biological, physical and / or agronomic, geotechnical (attractive and repellents) or low-toxic mineral and natural preparations.

Other principles of organic production:

- ✓ Balanced use of nutrients and organic matter in the soil;
- ✓ Effective use on water, soil, vegetable and animal resources;
- ✓ Diversity of genetic resources;
- ✓ Energy efficient use;
- ✓ Prohibition on the use of synthetic fertilizers and pesticides;

Minimal external investments;

- ✓ Recycling of nutrients (composted manure, plant residues, etc.); use of legumes and green manure;
- ✓ Production adapted to local agro-climatic conditions;
- ✓ Breeding of local breeds of animals and plant varieties; market flexibility;
- ✓ Minimum tillage, plant protection, drying, etc .;
- ✓ Minimal negative effect on the natural environment - preventive methods such as disease-resistant fruit species and crops; mechanical control, crop rotations with cereals (rye, wheat) and mixed crops for weed control;
- ✓ Farm production;

Advantages over conventional production:

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- ✓ Healthy foods of high technological quality are produced;
- ✓ Groundwater is protected from pollution by nitrates, pesticides, etc.;
- ✓ Increases the biological diversity, utilized natural, local and restored resources;
- ✓ Improves soil structure and fertility;
- ✓ Energy consumption is reduced by about 50%;
- ✓ Soil erosion is reduced by about 4 times;
- ✓ Earthworms and beneficial species are protected.

5.3. NATURE AND FEATURES OF ECOSYSTEM MANAGEMENT IN AGRICULTURE

Management of agro-ecosystems (ecosystems in agriculture) means the maintenance of such a balanced state of the "man-environment" system, which provides favorable conditions for human existence and preservation of the environment.

There are mainly two approaches used in the management of agro-ecosystems:

- *Approach to impact on business sites;*
- *Approach to the impact on individual natural sites - land, air, etc.*

In economic practice, the first approach is rather preventive in nature and is aimed at eliminating the sources of harmful effects on the natural environment.

The second approach of management is aimed at overcoming the disturbed balance in the natural environment through measures for reproduction of individual natural sites or by limiting the consequences of pollution and degradation. The two approaches are interrelated and complementary.

The interaction between the economic and environmental components of the agro-ecosystem means that special attention should be paid to each hierarchical level. Effective management at every level requires interdisciplinary knowledge. The strongest is the need to combine agro-economic and environmental knowledge at the level of agriculture. The ecological results of the production can be assessed only in the context of the applied agricultural practices (crop rotation system, fertilization, etc.) and the soil-climatic conditions, groundwater level, etc.

To assess and measure the environmental performance of agricultural holdings in Bulgaria and in comparison with other EU-28 countries, the linear programming method DEA - Analysis with data scope in the DPSIR framework is applied.

Driver-Pressure-State-Impact-Response (DPSIR) Methodological Framework

The DPSIR framework provides a framework in which to present the indicators needed to enable policymakers to provide feedback on the quality of the environment and the resulting impact of the policy choice or to make one in the future. The DPSIR framework implies a chain of causation, ranging from "drivers" (economic sectors, human activities) through "pressures" (emissions, waste) to "countries" (physical, chemical and biological) and "impacts" on ecosystems, human, health and functions, which ultimately leads to political "responses" (setting priorities, setting goals, indicators). Creating a DPSIR framework for the specific situation is a complex task,

The comparative analysis, based on the indicators of the DPSIR framework and the model, gives clarity about the state of environmental management in our country. Agricultural practices that pose

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a risk and put pressure on the environment have been identified, as well as those that do not endanger it or the negative impact is insignificant. Among the first is the rapidly growing use of nitrogen fertilizers, leading to excess nitrogen and water pollution; the unsatisfactory condition of the hydro-ameliorative structure and the extremely gravitational irrigation, leading to soil erosion and degradation; monoculture agriculture, which disrupts crop rotation, leads to increased nitrogen fertilization, unsatisfactory soil management, reduced biodiversity in the country, etc.

The methodological framework (DPSIR) with all 28 officially adopted indicators can be illustrated as follows:

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Table 20. DPSIR detailed model

Area / Field	Sub-area	Number	Title
REACTIONS	Public policy	1	Agri-environmental commitments
		2	Agricultural areas in Natura 2000
	Technology and skills	3	The level of training of farmers
			The use of consulting services for organic farms
	Market signals and attitudes	4	Area used for organic farming
DRIVING FORCES	Invested external resources	5	Use of mineral fertilizers
		6	Use of pesticides
		7	Irrigation
		8	Energy use
	Land use	9	Land use change
		10.1	Models for vegetable crops
		10.2	Animal husbandry models
	Farm management	11.1	Soil cover
		11.2	Tillage practices
		11.3	Storage of manure
	Trends	12	Intensification / extensification
		13	Specialization
		14	Risk of abandonment of land
	Pollution	15	Gross nitrogen balance
16		Risk of phosphorus contamination	
17		Risk of pesticides	

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Area / Field	Sub-area	Number	Title
PRESSURE		18	Ammonia emissions
		19	Greenhouse gas emissions
	Exhaustion of resources	20	Water abstraction
		21	Soil erosion
		22	Genetically diversity
	Benefits / Benefits	23	Agricultural land of high natural value
		24	Production of energy from renewable sources
CONDITION / INFLUENCES	Biodiversity and habitats	25	The population of birds inhabiting agricultural lands
	Natural resources	26	Soil quality
		27.1	Water quality - nitrate pollution
		27.2	Water quality - pesticide pollution
	Landscape	28	Landscape - condition and diversity

Source: Eurostat

DEA model for measuring environmental performance in agricultural holdings

Environmental efficiency Environmental efficiency is defined as the ratio of the economic indicator gross value added to indicators of the risk and pressure that agriculture exerts on the environment. These are unwanted investments that should be reduced in order to increase environmental efficiency. The higher the level of undesirable indicators, the higher the price at which gross value added is obtained (at a fixed value), as the scale of environmental damage is higher.

To measure environmental efficiency, a DEA model (Data Range Analysis) is applied, oriented towards proportional reduction of investments (input oriented). The essence of the DEA is in determining the best virtual producer based on all real farms. It serves as a benchmark in determining the efficiency of each of the surveyed farms. If a farm produces a volume of gross output with more investment (production costs) than the virtual producer, then that farm is inefficient. One farm is efficient, if its production function is at the limit of productivity, such as the productivity of the virtual producer, then the efficiency is equal to one, while for other, less efficient farms, the coefficients are between 0 and 1 (0 and 100%). The best virtual producer for a farm is

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made up of the weights of the most efficiently performing farms compared to that farm. These best performing farms are benchmarks for comparison with real producers.

5.4. ANALYSIS AND ASSESSMENT OF ENVIRONMENTAL MANAGEMENT IN AGRICULTURAL HOLDINGS

5.4.1. ANALYSIS OF ENVIRONMENTAL MANAGEMENT PRACTICES

The group of indicators that are most important include 1) farm management practices, 2) resource use and 3) land use.

These are indicators that give an idea of the activities of agricultural holdings that have the greatest pressure and impact on the environment. They reflect the effectiveness of eco-management on farms only indirectly, as they do not provide information on the state of the environment under their influence.

As a result of the analysis and assessment of the level of indicators for eco-management in agricultural holdings (driving forces) the following conclusions can be made:

5.4.1.1. AGRICULTURAL PRACTICES THAT DO NOT POSE AN ENVIRONMENTAL RISK:

- ✓ Low level of phosphorus fertilization, which does not endanger soil and surface water pollution;
- ✓ Insignificant amount of pesticides sold and low share of food samples with pesticide deviations;
- ✓ Low share of irrigated areas, which protects soils from leaching;
- ✓ Significant size of the areas with autumn-winter cereals, providing winter cover of the sown areas;
- ✓ Despite the tendency to intensify agricultural holdings, investment costs are relatively low and do not create preconditions for environmental risk;
- ✓ The declining number of cattle leads to a proportional reduction in manure and, in general, its spread does not pose a risk to the environment;
- ✓ Insignificant share of land converted for non-agricultural purposes.

5.4.1.2. AGRICULTURAL PRACTICES THAT ARE RISKY FOR THE ENVIRONMENT:

- High growth of nitrogen fertilization in a negative ratio with phosphorus fertilizer, which leads to salinization, oxidation and degradation of soils and the risk of water pollution;
- Almost entirely gravity irrigation with high water consumption and risk of soil degradation;
- Increasing the share of fuels from petroleum products and reducing the use of gas;
- Extremely high proportion of UAA in crop holdings and simplified production structure, which upsets the nutrient balance and requires significant amounts of nitrogen fertilization;
- Low animal density, which does not provide the necessary manure for crop production and increases the need for mineral fertilizers;

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- Low share of farms with manure storages, which creates preconditions for soil and water pollution;
- Presence of UAA without green cover, which increases the risk of soil erosion;
- High share of UAA with conservation treatment, which increases the need to increase fertilizers and especially pesticides;
- Risk of land abandonment in remote and sparsely populated areas in low-income farms and a significant share of farmers over retirement age.
- Assessment of the pressure and impact of eco-management on agricultural holdings on the environment

5.4.2. INDICATORS OF MANAGEMENT PRESSURE ON THE ENVIRONMENT

As a result of the analysis of the way in which the agricultural holdings and the agricultural practices implemented in them put pressure on the environment, the following conclusions can be made:

Agricultural practices that put environmental pressure on the environment:

- Excess nitrogen in the soil leads to strong pressure on biodiversity and pollution of water with nitrates. The relatively low level of surplus in the gross nitrogen balance at national level leads to underestimation and, as a result, to an increase in the risk of surpluses in certain areas.
- Insufficient phosphorus fertilization affects the degradation and acidification of the soil. Conversely, there is an excess of phosphorus in certain areas with intensive livestock farming due to the accumulation of manure, which leads to the leakage of phosphorus and water pollution.

Bulgaria ranks middle in the EU in terms of GHG emissions from agriculture, mainly due to unsatisfactory soil management and increasing application of nitrogen fertilizers, which can be considered as a significant environmental pressure that should be limited.

- The unsatisfactory condition of the hydro-ameliorative infrastructure and the irrational water consumption in the agriculture of Bulgaria, combined with the high water consumption in the branch, can lead to over-exploitation of the water sources and disturbance of the ecological systems.
- The natural conditions (relief, climate and soils) and the unsatisfactory way of land management and administration in Bulgaria have led to a significant spread of water and wind erosion in the country, which is among the most significant factors for environmental damage.
- The restoration and maintenance of local breeds of varieties and animals increases the biodiversity in the country, but the ecological pressure and the risk of their extinction is not overcome.

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- The production of energy from renewable sources in the agriculture of Bulgaria is insignificant, it does not contribute to the reduction of fossil fuels and greenhouse gas emissions from all sectors of the economy.

Agricultural practices that have a relatively low environmental pressure on the environment:

- ✓ Although pesticides are one of the main factors in agricultural pressure on human health and ecosystems, as a result of strict controls on their content in food, it is very rare to exceed regulatory standards.
- ✓ Bulgaria has the highest rate of reduction of ammonia emissions from the agricultural sector among the EU countries and the lowest share of the sector in the total production of ammonia emissions in the country, which means that agriculture in our country puts less pressure on ammonia pollution compared to other countries and other sectors of the economy.
- ✓ The share of lands with high natural value in Bulgaria is among the highest in the EU-28, which creates preconditions for protection of ecosystems within their borders.

5.4.3. INDICATORS THAT INFLUENCE THE STATE OF ENVIRONMENT MANAGEMENT

5.4.3.1. AGRICULTURAL PRACTICES THAT HAVE LED TO ENVIRONMENTAL DAMAGE

- With the accelerated pace of change in the way agricultural lands are used and their conversion mainly into fields, there is a decrease or disappearance of the populations of many of the species closely related to grassland habitats.
- The level of nitrogen fertilization in Bulgaria and the presence of excess nitrogen in agricultural lands pollute groundwater and river water, as well as other water basins, which damages the environment. This is the main environmental problem caused by the applied agricultural practices in Bulgaria.
- There is a decrease in the distribution of potential natural vegetation (high degree of hemerobia) within the agricultural landscape.

5.4.3.2. AGRICULTURAL PRACTICES THAT HAVE LED TO THE PRESERVATION AND IMPROVEMENT OF THE ENVIRONMENT

- ✓ The soils in Bulgaria have a relatively good quality and productivity for the production of biomass (organic substances).

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- ✓ Pesticide pollution of surface and groundwater is not a problem, as only isolated cases of pollution have been identified in our country.
- ✓ Bulgaria has a better structure of the agrarian landscape compared to the EU average, taking into account a higher share of territories with dominant agricultural lands and a high diversity of cultivated groups of crops and a lower share of territories with lands not used for agricultural purposes. whole and have a low diversity of crops.

5.5.THE BULGARIAN STATE POLICY FOR ENVIRONMENTAL MANAGEMENT IN AGRICULTURE IN COMPARISON WITH THAT OF THE EU

5.5.1. EVALUATION OF THE INDICATORS FOR ADMINISTRATIVE SUPPORT TAKING INTO ACCOUNT THE IMPACT OF THE ENVIRONMENT IN AGRICULTURE

- Bulgaria is among the countries with a low share of UAA, included in agri-environmental measures, among which the management of the landscape, pastures and agriculture in lands of high natural value occupies a primary place.
- Bulgaria ranks one of the first places in the EU in terms of the relative share of the area included in NATURA 2000. At the same time, the share of the territories with target agricultural habitats in the total area of Community importance (SCI) is significantly lower than the EU average. greater risk for their protection.
- Bulgaria ranks first in the EU countries in terms of growth in the area of organic production of agricultural crops, one of the first places in organic production of honey and among the leading countries in organic sheep. It lags behind in organic pig and cattle breeding.
- The managers of the agricultural holdings in Bulgaria are mostly with only practical experience, without specialized education, which is a sign of low information and lack of interest. As a result, the share of agricultural producers in Bulgaria who have undergone training or have used consulting services dedicated to the environment is practically insignificant.

5.5.2. EFFECTIVENESS OF INSTITUTIONAL MECHANISMS IN ENVIRONMENTAL PROTECTION IN AGRICULTURAL HOLDINGS

The main institutional mechanisms for the state's impact on agri-eco-management are the measures and directions under the RDP in the two programming periods (2007-2012; 2014-2020) and the introduction of "green payments" in the CAP 2014-2020.

To a large extent, the measures and their objectives from the RDP 2007-2013 are preserved in the RDP 2014-2020. Organic (organic) agriculture is separated in a separate measure, and payments for areas with natural constraints are combined in one measure. However, the financial resource for environmental measures in the RDP 2014-2020 is significantly higher, and when the scheme for

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direct green payments under the first pillar of the CAP is added, the funds for ecology reach almost half of the financial resource of the CAP in Bulgaria.

Figure 1. CAP measures for OS management



Figure 22. CAP measures for OS management

Source: NAAS

It turns out that 87% of the paid funds and over 88% of the subsidized areas are in the direction of crop rotation. The average amount of funds per contract is 344 thousand euros (62 euros / ha), which is an extremely high amount of support not only in Bulgaria but also in the EU.

Organic production, which is considered the main direction of the agri-environmental policy of the state, occupies only 8% of the funds spent. The concluded contracts are about 2,000 for nearly 300 thousand decare, which means an average of EUR 19.2 thousand per contract and EUR 124 / decare. The size of the area represents 0.8% of the UAA, which is far below the originally set and widely known 8% for organic production.

For control of soil erosion, which is one of the main environmental problems in the country, only 35 contracts have been concluded for nearly 12 thousand decare and 0.1% of the resources under OS 2 have been paid. This can be explained by the low compensatory rate between 4 and 13 euro / dca for most of the measures in this direction, while for the introduction of network circulation the rate is 18 euro / dca (SFA, 2013) with realized 62 euro / dca. The funds paid for the other areas under the measure occupy between 0.02 and 2.3% of the total amount, almost as much of the subsidized areas affect a negligible share of farmers.

It is clear that this measure is not effective enough, as the majority of the funds spent have been used to support large and possibly profitable farms. It is positive that the direction for maintaining

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crop rotation is dropped from the RDP 2014-2020 and is transformed into a requirement for crop diversification and maintenance of ecologically oriented areas within the green payments under the first pillar of the CAP.

Table 21. Comparison of environmental measures and directions in the RDP

RDP 2007-2013	RDP 2014-2020
Measure 214: Agri-environmental payments	Measure 10: Agri-environment and climate
1. Organic plant growing	A new measure
2. Organic beekeeping	A new measure
3. Restoration and maintenance of permanently grassed areas with high natural value - undergrazed (VPS-1) and overgrazed (VPS-2);	1. Restoration and maintenance of permanently grassed areas of high natural value (HVF);
4. Maintenance of habitats of protected species in arable lands in ornithologically important places (VPS-4)	Maintenance of the habitats of the wintering species of geese and meadow geese in arable lands of ornithological significance; Maintenance of the habitats of Imperial Eagle and Egyptian Vulture in arable lands of ornithological significance;
5. Maintaining landscape features	No
6. Introduction of crop rotation	No
7. Soil erosion control	4. Soil erosion control;
8. Conservation of endangered local breeds	Conservation of endangered local breeds important for agriculture; Conservation of endangered local varieties important for agriculture - new
9. Traditional practices for seasonal grazing (pastoralism)	7. Traditional practices for seasonal grazing (pastoralism)
Measure 214: Agri-environmental payments	Measure 11: Organic farming
1. Organic plant growing	1. Organic plant growing in transition - new
2. Organic beekeeping	2. Organic beekeeping c transition - new

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RDP 2007-2013	RDP 2014-2020
	3. Organic animal husbandry in transition - large and small ruminants - new
	4. Organic plant growing
	5. Organic beekeeping
	6. Organic animal husbandry - large and small ruminants - new
M 213: Natura 2000 I Water Framework Directive	Measure 12: Natura 2000 and the Framework Directive on water
Compensatory payments for agricultural land in Natura 2000 (arable land, permanent crops, permanent grassland)	Compensatory payments for agricultural land in Natura 2000 (arable land, permanent crops, permanent grassland)
Measure 211: Payments to farmers for natural constraints in mountainous areas	Brand 13: Payments for areas facing natural or other specific constraints
Measure 212: Payments to farmers in restricted areas other than mountain areas	
	Compensatory payments in mountainous areas
	Compensation payments for other areas affected by significant natural constraints
Other measures: P01-Knowledge transfer, M02 - Consulting services, M04 - Investments, M16 - Cooperation	Payments under all agri-environmental priorities, incl. energy efficiency, renewable energy production and reduction of air pollution.

Source: According to data from RDP 2007-2013 and RDP 2014-2020

In summary, the following conclusions can be drawn:

- The separation of organic farming in a new measure and the inclusion of livestock in it is positive;
- The suspension of payments for crop rotation under the RDP is correct, but control must be exercised in order to prevent overpayment in the direction of combating erosion;
- The funds for environmental protection are too high share in the RDP 2014-2020;
- The funds allocated for Measure 10 "Agri-environment and climate" are unreasonably high, given the reduced interest in the same areas in the previous programming period;

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- More than half of the investment funds under Measure 04 are for environmental protection, although there is a greater need to improve the viability, competitiveness and marketing of agricultural products;
- The funds provided for renewable energy and increase of energy efficiency are especially high, given that in Bulgaria it ranks third in the lowest energy consumption of the 1st UAA;
- The diversification of the production structure and the maintenance of ecologically oriented areas on agricultural holdings will lead to a decrease in net income due to increased costs or lost benefits;

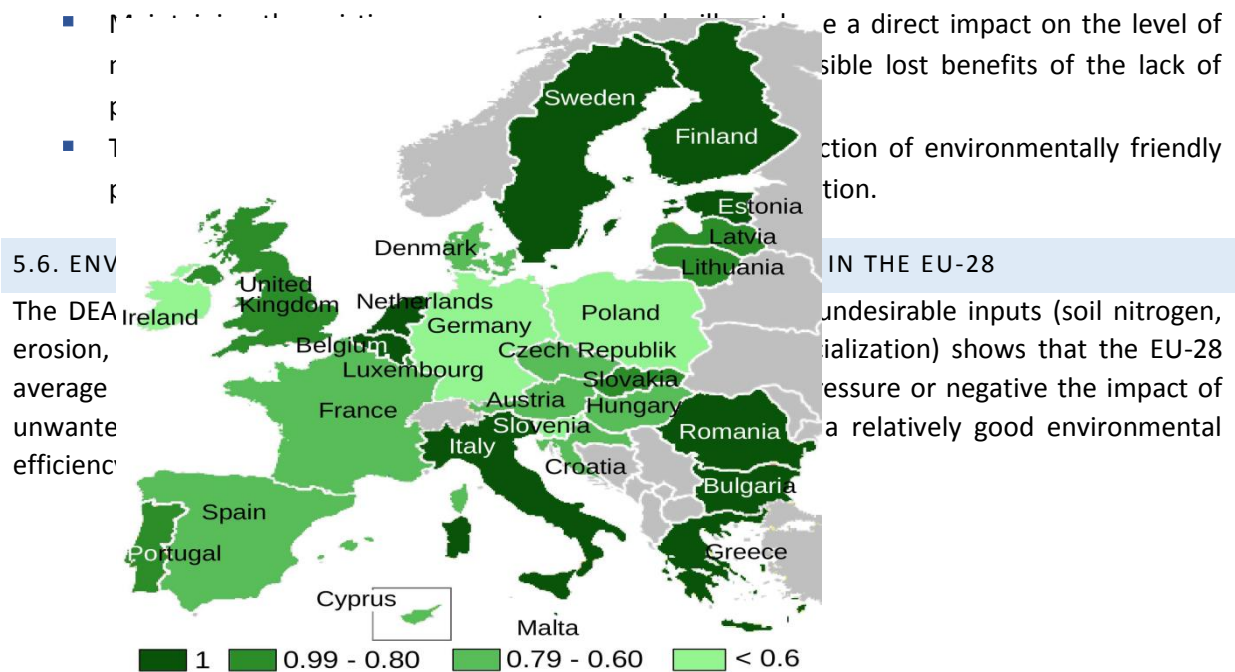


Figure 23. Results of the environmental efficiency of agricultural production in the EU-28

⁸ https://www.researchgate.net/publication/329378745_Eco_Efficiency_Evaluation_of_Agricultural_Production_in_the_EU-28

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The higher environmental efficiency for Bulgaria compared to the EU-28 average is due exclusively to the low level of ammonia emissions per UAA, which is a result of the low ruminant density. Comparing the actual data with the project data as a result of the DEA decision, it is established that the lowest rate should reduce ammonia emissions in both the EU-28 and in Bulgaria, by 35% and 37%, respectively.

The strongest pressure on the environment and the corresponding impact in the direction of reducing environmental efficiency are exerted by the high degree of specialization of UAA and the high level of erosion. This is valid both on average for the EU-28 and for Bulgaria, but in Bulgaria the efficiency is significantly lower and a greater reduction in the amount of erosion and the share of UAA specialization is required. The very large difference in the specialization of UAA by report and project for Bulgaria can be explained by the large range between EU member states - from 6.5% (Luxembourg) to 85% (Bulgaria) and the lower amount of gross value added in countries that have a higher share of UAA in crop holdings (because less added value is created in crop holdings). The Netherlands, which has the highest level of gross value added and a relatively low share of UAA in crop farms (31.2%) has the highest environmental efficiency and only participates in the formation of the virtual producer in the individual decision on the effectiveness of specialization. With 2% environmental efficiency of the UAA specialization, Bulgaria occupies one of the penultimate places in the EU-28 and significantly below the average level (18%). This is a confirmation of the high environmental risk, which causes the unilateral specialization of UAA in the field of crop production in our country. With 2% environmental efficiency of the UAA specialization, Bulgaria occupies one of the penultimate places in the EU-28 and significantly below the average level (18%). This is a confirmation of the high environmental risk, which causes the unilateral specialization of UAA in the field of crop production in our country. With 2% environmental efficiency of the UAA specialization, Bulgaria occupies one of the penultimate places in the EU-28 and significantly below the average level (18%). This is a confirmation of the high environmental risk, which causes the unilateral specialization of UAA in the field of crop production in our country.

Almost as much ecology is threatened by soil erosion and this is understandable, as monoculture agriculture is one of the main causes of soil degradation and erosion. The ecological efficiency in terms of soil erosion is 1% for Bulgaria compared to 7% for the EU-28. The Netherlands is again 100% environmentally efficient and a virtual producer for other countries, which is the result of a combination of the highest gross value added and one of the lowest levels of erosion - 0.3 t / ha. In Bulgaria, erosion is 2.1t / ha, which is an average amount, but due to the low gross value added, environmental efficiency puts the country in 22nd place. This means that receiving 1 gross value added in Bulgaria causes a relatively higher degree of erosion or environmental damage than in countries such as Italy (8.5 t / ha),

Excess nitrogen and greenhouse gas emissions have an almost equivalent, moderate impact on the level of environmental efficiency. In order to achieve an optimal level of efficiency, the two "unwanted investments" should decrease at a higher rate than the EU-28 average, which is significant. The individual environmental efficiency for excess nitrogen is 23% and for greenhouse gases 28%, which ranks Bulgaria 15th and 14th in the EU-28, respectively.

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The size of the slacks in the DEA's decision on the total impact of unwanted investments shows that the greatest opportunity for improving environmental efficiency in Bulgaria is in terms of UAA specialization. With a 31.7% radial “proportional” reduction of UAA in crop farms, which achieves the efficiency of the virtual producer, in Bulgaria there is a possibility for further reduction of the share of specialized UAA by another 51%. This is the highest slack in the EU-28 in terms of UAA and is due not only to the highest share of UAA in crop holdings, but also to the low level of gross value added that these farms have. There is a higher slack for Bulgaria compared to the EU-28 average and compared to the proportional reduction in terms of erosion, which once again confirms that the gross added value created in our country mainly by plant growing has a high price, measured by the caused soil damage. There is also a significant reduction that can be achieved with the amount of excess nitrogen in the soil, although compared to the EU-28 average, the problem is smaller.

It can be argued that obtaining high added value in the old EU Member States is associated with significant pollution and environmental degradation, while in the new Member States pollution is significantly less, but 1st added value is obtained with a greater degree of environmental damage. This requires optimizing the value added: pressure (impact) on natural resources in all countries, which can be achieved through CAP eco-management tools.

5.7. ECOLOGICAL EFFICIENCY OF PLANT FARMS IN BULGARIA BY PRODUCTION DIRECTION

In summary, the following conclusions can be drawn:

- ✓ The environmental efficiency in terms of the selected five investments for Bulgaria is higher than the EU-28 average. This is extremely a result of the severely limited emissions of ammonia due to the reduction in the number and density of ruminants in the country.
- ✓ The environmental efficiency in terms of individual indicators for excess nitrogen, soil erosion, greenhouse gases and the share of UAA in crop farms in Bulgaria is lower than the EU-28 average.
- ✓ The most significant problem from an ecological point of view is the high share of UAA in crop farms, which is a sign of monoculture agriculture and its accompanying shortcomings - soil degradation and erosion, increased nitrogen fertilization, unfavorable ratio between different land categories, unsatisfactory soil management. etc.
- ✓ In the new EU member states, environmental pollution is significantly lower than in the old member states, but the price for 1 value added, measured by the damage caused, is higher due to lower productivity and productivity in Eastern European countries.
- ✓ The ecological efficiency in the specialized plant farms in Bulgaria in terms of the costs for fertilizers and pesticides is low. The lowest-efficiency cereal holdings should significantly reduce the cost of mineral fertilizers, and the vegetable holdings should reduce the cost of both fertilizers and pesticides almost equally.
- ✓ Mixed field farms are more efficient than cereals due to the more limited use of pesticides, but the cost of mineral fertilizers should be reduced.

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- ✓ Higher environmental efficiencies on orchards and vineyards are the result of limited mineral fertilization, but there should be significant optimization of pesticide costs, especially for vineyards.

It is obvious that in order to increase the environmental efficiency in Bulgaria, effective measures and mechanisms are needed, which will lead to an increase in productivity on the one hand and a reduction in unwanted investments on the other.

5.8. GUIDELINES FOR IMPROVING THE ENVIRONMENTAL MANAGEMENT IN AGRICULTURAL HOLDINGS

5.8.1. GUIDELINES FOR IMPROVING ENVIRONMENTAL PRACTICES

In terms of risk grading, the highest score is for farm specialization, soil erosion, high water consumption, etc.

Guidelines for improving environmental practices cover:

Resource consumption:

- ✓ Reducing the norms share of areas with nitrogen fertilization. This will solve the main environmental problem in our country - excess nitrogen in the soil and nitrate pollution of river and groundwater;
- ✓ Increasing phosphorus fertilization in order to overcome the existing shortage in the soil (negative balance), as well as to improve the nitrogen: phosphorus ratio, which is important for the balance in the soil nutrient system;
- ✓ Change in irrigation practices - transition from extremely gravity irrigation to practices leading to lower water consumption and less water erosion. Limiting the share of groundwater used for irrigation, which has a negative impact on ecosystems;
- ✓ Reducing the share of fossil fuels used, which will further reduce greenhouse gas emissions from agriculture.

Land use:

- ✓ Maintaining the low share of agricultural land with changed purpose;
- ✓ Change in the structure of agricultural land by categories - reduction of sown area and increase of lawns. This will allow the restoration and protection of genetic diversity and the population of birds inhabiting agricultural lands;
- ✓ Increasing the number and density of ruminants. This will improve the production structure, increase the share of fodder and grassland, reduce the risk of abandonment of agricultural land and increase the value of the added value created in agriculture;

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- ✓ Restructuring of UAA, which will allow restoration and maintenance of local varieties and breeds of animals and conservation of biodiversity in the country;
- ✓ Restructuring of the UAA, which will lead to a reduction in the degree of hemorrhage (deviation of the available from the potential natural vegetation) and improvement of the agricultural landscape;
- ✓ Development of agrarian (farmer) tourism and creation of more certified products, which will increase the social assessment of the agrarian landscape.

Soil and manure management:

- ✓ Reducing the share of UAA with conservation treatments, reducing the soil without grass cover, incl. set-aside and increase the share of areas with cover and intermediate crops. These are basic anti-erosion practices that will limit the high share of soil erosion in the country and will reduce the need for the use of pesticides;
- ✓ Improving soil management (stubble burning, soil cover, fertilization), with a view to reducing greenhouse gases from agriculture;
- ✓ Construction of manure storage facilities in large farms with a concentration of ruminants.

5.8.2. GUIDELINES FOR IMPROVING ENVIRONMENTAL POLICIES IN AGRICULTURAL HOLDINGS

First, the recommendations relate to increasing the effectiveness of the implemented policies and improving the administrative capacity of the institutions responsible for their implementation.

- ❖ The basis of effective environmental policy is the updating of the regulatory framework in our country in accordance with the changes in the regulatory (legal) framework in the EU. But at the same time, the effectiveness of law enforcement needs to be significantly increased, especially by strengthening control and criminal liability (especially in the field of land use of high nature value and those covered by NATURA 2000).
- ❖ Clarity and supervision of the use of financial resources intended for environmental protection must also be one of the main priorities for environmental policies in agriculture. This will achieve a greater balance in spending funds and directing them to solve significant environmental problems and protect endangered natural resources.
- ❖ Improving administrative capacity requires training and preparation to stabilize and raise the profile of decision-making institutions. It comes down to the detailed knowledge of all the requirements for eco-management, as well as their practical application. In this regard, it is extremely important to strengthen the administrative capacity of experts at the National Agricultural Advisory Service at the district level, where the need for specialized information, training and advice to farmers is greatest.
- ❖ The policy must seek to increase the environmental culture of farmers. The ecological culture of agricultural producers is a stable basis for progress and development in the establishment

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of modern environmentally friendly agriculture. The lack of knowledge of the basics and the importance of agri-environmental management determine the low level of efficiency in the implementation of these principles. Only a policy that reinforces the principles of eco-management can be highly effective, and the measures taken must be the result of complicity and cooperation between the state, business, science and consumers.

- ❖ Of great importance for raising the ecological culture of farmers is their training and expert assistance offered by the National Agricultural Advisory Service, the scientific units of the Agricultural Academy and agricultural universities, which provide consulting services, up-to-date information and technical assistance for effective implementation. eco-management in the country's agriculture. Internet access is also an effective method of self-study and expert assistance. In almost the whole country, such access is possible, but the quality of the service should be significantly improved.
- ❖ The prosperity of agriculture is increasingly associated with improving the quality of production through the use of environmentally friendly methods and technologies. The introduction and control of compliance with quality standards, as well as increasing criminal liability for non-compliance, are also measures to improve the policy.
- ❖ Environmental protection policies in agriculture must focus on the efficient use of natural resources and the reduction of the high risk of the pressure of the used agricultural practices, of the inefficient and incomplete implementation of risk reduction measures. In this sense, policy must focus on the implementation of preventive actions.

Reducing the high risk of pressure on the environment is directly related to minimizing pollution processes. The Nitrates Directives, the Water Framework Directive, all projects for the conservation of biodiversity in territories, including those covered by NATURA 2000, are several legislative instruments aimed at environmental management.

The results of the measures introduced are rather modest, well below the European average. Although Bulgaria has a high share of protected lands in NATURA 2000, a high rate of organic production of agricultural crops and is among the leading countries in the production of organic honey and organic sheep, the share of UAA included in agri-environmental measures, and the share of areas with targeted agricultural habitats in the total area of Community importance (SCI) is among the lowest in the EU-28. The lag in organic cattle and pig breeding is significant.

The educational level of the farmers is extremely low, for the most part they have only practical experience. To overcome this lag, the focus of the state and the distribution of support should be in the following areas:

Increasing the share of UAA with agri-environmental commitments through:

- introduction of mechanisms and measures for restriction of monoculture agriculture and reduction of the share of UAA in crop farms. Such measures may be support for holdings with an average yield of cereals or sunflower above a certain minimum, in order not to support low-yielding land for grain production, but to provide support for their conversion

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into grassland; support only up to a certain proportion of the fields on a given farm in order to stimulate the diversification of the crops grown; the increase in the share of coupled support for livestock, instead of the planned reduction from 13% to 10%, etc.

- expansion of the areas where anti-erosion measures are carried out and increase of the funds for anti-erosion measures, in order to solve this most serious ecological problem in the country. As already mentioned, the unsatisfactory implementation of the anti-erosion measure under the RDP 2007-2013 can be explained by the low level of compensation, and in the RDP 2014-2020 the share of the provided support areas is insignificant. It is also possible to increase the 5% mandatory share of ecologically oriented areas by differentiating the requirements for the introduction of a certain type of anti-erosion practice (buffer strips, intermediate crops, green cover in winter, types of grass strips, tree crops, nitrogen-fixing crops and etc.) depending on the natural and climatic conditions in the area and the condition of the soil.
- Increasing the attractiveness of the sites in NATURA 2000 and other lands with high natural value through:
 - introduction of support measures for investments in NATURA 2000 sites that meet the requirements for environmental protection, based on a preliminary impact analysis;
 - support for unification (grouping) of owners and producers in NATURA 2000 and UPU areas for more effective biodiversity conservation. A number of studies have shown that the application of measures for the conservation of biodiversity and the maintenance of habitats only on the territory of one or several scattered farms is ineffective. Real results are obtained only when the measures are applied by all farmers in a given territory.

Increasing organic production through:

- maintaining and enriching support measures, mainly in animal husbandry and related organic feed production;
- increasing support for consulting, training and certification with the active participation of the Agricultural Academy and the National Agricultural Advisory Service;
- introduction of measures supporting the expansion of the range of organically certified products and their marketing;
- speeding up the process of reaching the target of 8% UAA with organic production;
- extending the term for organic production contracts in order to end the trend of cessation of activities and even leaving the sector after the expiry of the current 5-year contract;
- extension of contracts for young farmers, a significant part of whom carry out organic production, in order to encourage them to stay in the sector.
- Solving the problem with the low educational level of agricultural producers through: organizing courses, trainings, demonstrations. The problem is, on the one hand, demographic, due to the high share of the elderly population in the country and the sector, and on the other - social - the significant reduction of livestock and the outflow of skilled

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labor is a result of subsidies and support, which mainly benefits investors and producers of cereals and industrial crops.

- strengthening the information activity among the producers, incl. the individual direct or indirect contacts with them and raising the awareness of the population about the condition and the goals for its protection.

Thirdly, the recommendations are aimed at rearranging the priorities and some additions to the measures used in the CAP and RDP 2014-2020. In addition to the expansion of anti-erosion measures to solve the main environmental problem in our country, the support mechanisms should include as a priority:

- *support for the improvement of existing irrigation infrastructure.* The aim is to significantly reduce the consumption of irrigation water from both surface and groundwater sources (according to the EU, the reduction should be 5-25% of the current level in order to provide support.) In addition, the introduction of technological solutions, other than gravity irrigation will limit soil erosion;
- *incentives to reduce nitrogen fertilization,* which will lead to a reduction of excess nitrogen in the soil and nitrate pollution of water. To the greatest extent this can be achieved by restructuring production by reducing subsidies per decare for crops requiring high rates of nitrogen fertilization, by improving crop rotations and introducing nitrogen-containing crops, by supporting the import and use of manure. fertilizer;
- *conservation of genetic resources* - additional support for the institutes of the Agricultural Academy to continue the activity of maintaining the genetic banks. Representatives of the private and non-governmental sector may also be involved in this activity, but the main responsibility should lie with state institutions.

5.9. THE NEW CAP. LIST OF AGRICULTURAL PRACTICES BENEFICIAL FOR THE CLIMATE AND THE ENVIRONMENT.

On 10.08.2020 the Ministry of Agriculture, Food and Forestry has published a document entitled "List of agricultural practices beneficial for the climate and the environment".

The document focuses on the post-2020 CAP model, reflecting the greater ambitions of the EU and Member States in terms of environmental and climate change goals. It provides an overview of the on-farm production and management systems, including:

- Conservation agriculture. Treatments aimed at preserving the soil resource.
- Organic farming.
- Integrated production of plants and plant products
- Practices for precision agriculture

The head **Practices in plant growing** contains the following types of practices:

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- 1. Practices related to the selection and consistency of the crops grown, as well as activities related to improving the condition of the soil.*
- 2. Practices related to ensuring effective irrigation of crops, retention of soil moisture and temperature*
- 3. Weed control practices, pests and plant diseases*
- 4. Erosion threat management practices.*
- 5. Management of landscape elements and pastures*
- 6. Practices aimed at conservation and restoration of biological diversity*
- 7. Agroforestry*

Animal husbandry practices reflect:

- 1. Animal welfare.*
- 2. Conservation of endangered local rare breeds of animals.*
- 3. Practices to reduce ammonia emissions into the air from agricultural sources.*
- 4. Practices for reducing nitrate emissions in waters discharged from agricultural sources (from the rules of water protection.)*
- 5. Counteraction to animal diseases and control of pathogenic diseases.*

Beekeeping practices are covered by:

- 1. Mobile beekeeping: Ensuring a diverse grazing of bees through relocation of bee colonies for seasonal grazing.*
- 2. Stimulating cooperation between growers and beekeepers for provision of a service for ensuring natural pollination*
- 3. Buffer strips sown with herbs, flowers, honey plants and plants for pollinators*

Training, knowledge exchange, innovation

There is a growing importance of better information, advice, training and innovation for the modernization of the agricultural sector by promoting and sharing knowledge, innovation and digitalisation in agricultural production and rural areas. The document concludes with recommendations for training related to the increase and exchange of knowledge, for the application of good agricultural practices, contributing to the protection of the environment and adaptation to climate change.

Farmers, through SZISS - AKIS, incl. through the Agricultural Advisory System, have the opportunity and access to a wide range of advisory services and training in the field of environmental protection and combating climate change. These systems enable farmers to receive up-to-date technological and scientific information developed through research and innovation. The National Agricultural Advisory Service is a key part of the Agricultural Advisory System and an important link between

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agricultural business and science. Knowledge and information exchange activities are further supported both through the European Innovation Partnership for Agricultural Productivity and Sustainability (EPI) and through EU research projects, incl. through the Horizon 2020 program.

Additional information on good practices for climate and environmental benefits farmers can become part of various European networks on these issues, incl. on the networks under the project Networked European Farms to Promote the Mutual Enrichment of Knowledge and the Use of Innovation through Demonstrations (NEFERTITI) and the project "Connecting Advisors to Support Interactive Innovation in Agriculture and Forestry" (i2Connect).

Digitalization in agriculture is linked to the successful implementation of good agricultural practices. Use of data from the Sentinel satellites under the Copernicus Program for forecasting crop development, mowing dates, fertilization rates, watering, sowing, crop harvesting, soil nitrogen content or drought stress of crops, etc. (applications for intelligent agriculture); liaison of farmers with the LPIS, the AKIS Advisory Services, the IACS Area Monitoring System, the FaST instrument, smartphones, etc. ; in the case of welfare - sensors for monitoring the health of animals, food rations, connection with VetIS, keeping an online register of animal health, etc.

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TASK 6.ANALYSIS AND SELECTION OF YOUTH-MANAGED SMES FROM THE AGRICULTURAL SECTOR FOR INCLUSION IN THE NEXT PROJECT ACTIVITIES (PILOT FARMS).

Following the in-depth interviews, the table below includes the holdings selected from the four areas to participate in the project activities:

The following farms were selected from the four EMS pilot study areas:

farm	BRANCH	MUNICIPALITY
BLAGOEVGRAD REGION		
1	crop production	Gotse Delchev
2	crop production	Blagoevgrad
3	Livestock	Hadjidimovo
4	Livestock and crop production	Yakoruda
5	crop production	Sandanski
KARDZHALI REGION		
1	crop production	Kardzhali
2	Livestock	Kardzhali
3	Plant growing	Kardzhali
4	Mixed farm	Kardzhali
5	crop production	Kardzhali
6	crop production	Kardzhali
SMOLYAN REGION		
1	Livestock	Rudozem
2	Beekeeping applies for 6.3	Smolyan
3	crop production	Bratsigovo
4	crop production and Livestock	The bathrooms
5	crop production and Livestock	Smolyan
HASKOVO REGION		

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1	Livestock	Haskovo
2	Livestock	Harmanli
3	Livestock	Topolovgrad
4	crop production	Svilengrad
5	crop production	Svilengrad

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ANNEX 1 – SURVEY



Assessment of the awareness of young people, owners of SMEs in the field of agriculture, about the environmental problems related to the activity of their enterprises

This survey is conducted in order to study and analyze the awareness of young farmers about the existing environmental problems on their farms, as well as in the agricultural sector in the field.

Some of the respondents will have the opportunity to apply research and design research on their farms in order to apply more environmentally friendly practices. In addition, farmers will have the opportunity to exchange experiences with colleagues and scientists from Bulgaria and Greece, as well as to participate in a free two-week training in Bulgaria related to the EMS system, which is being developed within the project. Selected farmers will have the opportunity to participate free of charge in a study visit to similar farms in Greece.

The study is in line with the requirements of the GDPR. By completing this questionnaire, you agree that the data from your answers will be processed by the Agricultural University of Plovdiv, contractor and Oberon Ltd., sub-contractor for the above project, for the purposes of the project. Thank you for your cooperation!

* 1. Are you interested in environmental protection in general, and in your district / municipality in particular?

Yes

No

* 2. Do you follow the policy of the Republic of Bulgaria related to the implementation of agri-environmental measures?

* Yes

No

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3. How do you get information about the policy of the Republic of Bulgaria related to the implementation of agri-environmental measures?

Onlinemedia

Print media

Websites of state institutions

Branch organizations

Relatives, friends and

colleagues Other

(Please, clarify)

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* 4. Are there any unresolved environmental problems in your area / municipality / farm and if so, which ones?

- contamination of soils, erosion
- lost of nutrients in
- pollution of waters
- lack of water for irrigation or production
- purposes
- problem with landfilling or waste treatment

no

Other (Please, clarify)

* 5. Have you taken / do you plan to take measures to overcome the negative consequences of environmental problems?

- Yes
- No

6. What measures do you plan to take or have already taken to overcome the negative consequences of environmental problems?

* 7. Do you apply agri-environmental practices on your farm?

- Yes
- No

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8. If the answer to Question 7 is Yes, please indicate from the following?

- I observe the necessary crop rotation of the crops
- I apply less intensive agricultural practices than before I use less pesticides and mineral fertilizers
- I plant and maintain anti-erosion walls of trees and shrubs, as well as other anti-erosion practices pass / I have already switched to organic farming

Other (Please, clarify)

* 9. Do you have a sanction imposed so far for established violations in terms of environmental pollution (air, soil, other):

- Yes
- No

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10. If the answer to Question 9 is Yes, please state the reason.

* 11. Do you apply a circular economy to part of your farm? Eg do you reuse any materials? Do you process products? Do you compost waste? Do you reuse water? Do you have a closed cycle of resources without disposing of unnecessary ones? Something else? Please specify.

* 12. Do you apply nutrients / organic matter in a balanced or controlled way to the soil (eg measuring and calculating the specific amount of pesticides required for a specific crop; other?

* 13. Do you enrich the soil with various crops / crop rotation / other?

* 14. Do you use energy efficiently and do you think that even more energy savings can be achieved?

* 15. Do you use solar, wind or bio energy in your production / administrative base?

Yes

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No

* 16. Do you think that the car fleet on your farm can be replaced with a more environmentally friendly fuel?

Yes

No

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* 17. Do you carry out activities related to the protection of birds or endangered species or specific landscape or other?

* 18. Do you have water wells on your farm?

Yes

No

* 19. What kind of irrigation do you apply?

* 20. Do you see a decline in the bee population and are they important for growing crops on your farm?

* 21. Do you think that climate change has a significant impact on your production and if so, how?

* No

acid rains are observed more frequently

hail and / or floods become more frequent

droughts

Other (Please, clarify)



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* 22. You are:

Male

Female

* 23. Your age is?

* 24. Your education?

Higher agriculture

Other higher

Semi-higher

Medium agrarian

Other medium

Basic or lower

* 25. Your farm is registered in the Municipality ...

* 26. Size of the holding in economic units, incl. crop production, animal husbandry, processing, trade and services, other.

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**PROJECT „ENVIRONMENTAL MANAGEMENT ENHANCEMENT BY YOUTH-RUN SMES“ ENVIRONMENTYOU
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