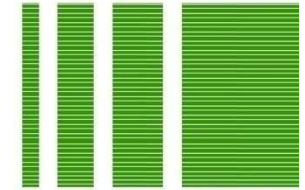
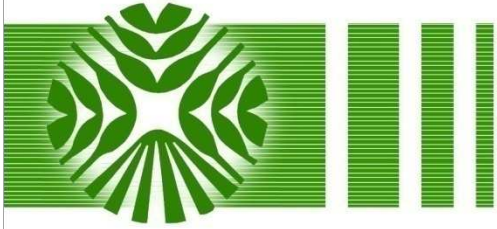


Impact of economics and agriculture over the environmental protection in Bulgaria

*Teodora Stoeva
Ekaterina Valcheva
Agricultural University – Plovdiv*

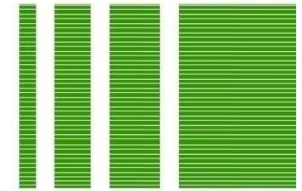


*23-25.11.2015. Warsaw, Poland
Institute of Agricultural and Food Economics
National Research Institute Warsaw, Poland*

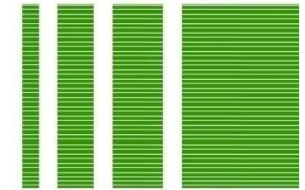


THE AIM

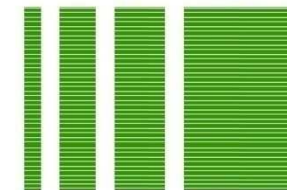
- **The aim:**
- to present the trends and dynamics of changes in the state of Bulgarian agriculture and environmental components in order to assist decision-making in the sphere of environmental protection related to the sustainable economic development of Bulgaria.



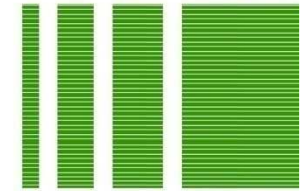
- Agriculture is and should remain the main link between people and environment. Like any human or economic activity, agriculture has an impact on the environment and its individual elements.
- The efficient use of land resources is of crucial importance for the sustainable development of Bulgaria.
- The negative effects on the environment associated with the excessive use of fertilizers in agriculture, more particularly the use of nitrogen fertilizers in an unbalanced way, are expressed in acidification of slightly buffer soils, contamination of surface water and groundwater by nitrates, nitrites, etc.
- The most significant sources of adverse impact on environment are the consumption of energy and natural resources by economic sectors and the emissions of harmful substances into the air, water and soil as well as landfill of waste.



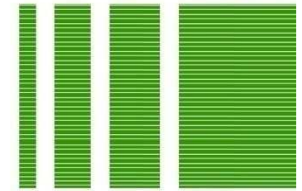
- Despite the reduction of energy intensity achieved by 2012 in comparison with 2005, with 22.4%, the end energy intensity of Bulgaria remains one of the highest among EU Member States which means that considerable efforts will be needed to achieve the objective by 2020 for reducing the country's energy intensity by 50% compared to the value in 2005.
- A positive trend is the significant increase in 2012-2013 of the production and consumption of energy from renewable sources in the country and we have exceeded the mandatory national purpose (for 2020) of 16% share of energy from renewable sources in gross end consumption of energy in the country according to the requirements of Directive 2009/28/EC.
 - The Energy sector (burning of fuels mainly from power engineering and in transport) emitted 74.0% of the aggregated GHG emissions for the last year of inventory - 2013. The largest share of aggregated GHG emissions in the sector belongs to CO₂ emissions – 96.8% of the emissions of the sector.



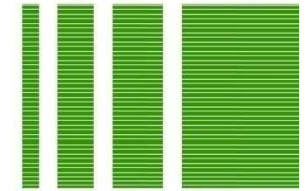
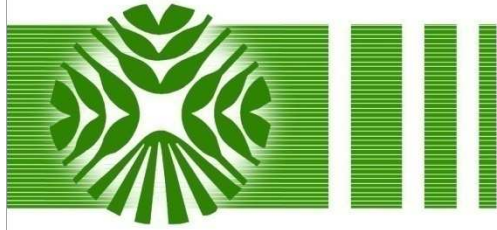
- In 2013 there was again a decrease in the end energy consumption, which is considerable and has reached 5% in comparison with the previous year, 2012. Nevertheless, power engineering remains the largest source of emissions of sulfur dioxide and nitrogen oxides and plays a key role in the formation of greenhouse gases (GHG) in the country, Thermal power plants have emitted 72% of the total amount of sulfur dioxide emitted in the country.
- In the period 2000-2013 the share of transport in the end consumption of fuels and energy increased from 21.5% to 30,3%. Road transport is the main consumer - for 2013 it consumed 92,2% of the total amount of energy used in the sector.
- In 2013, for the first time an increase was registered in the consumption of biofuels in the Transport sector, unlike the previous 5 years. The share of biodiesel in the total consumption of diesel fuel in road transport in 2013 was 7.17%, while in 2011 it was only 1.13%.



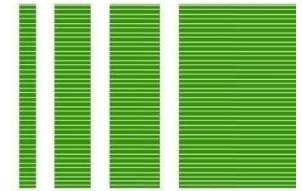
- The main atmospheric pollutants emitted by agriculture are ammonia (90%) and non-methane volatile organic compounds - 8% of national emissions. Agriculture is also a source of greenhouse gases. The processes and activities in this sector are sources mainly of CH₄ and N₂O. In 2012-2013, the emissions from Agricultural sector represented 10.4% of Bulgaria's total emissions of greenhouse gases.
- Compared to other European countries, Bulgaria has relatively significant fresh water resources, both in absolute volume and per capita. The fresh water resources of Bulgaria are estimated at 105.45 billion m³ per year, including the resource of the Danube River (long-term average 1961-2011) and are distributed unevenly throughout the country.
- The fresh water resources of Bulgaria are about 14 thsnd m³/yr average per person (including the resource of the Danube River), which puts the country among the top 10 European countries.



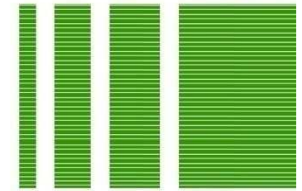
- At the same time, Bulgaria takes one of the leading positions in water abstraction average per capita and it is among the European countries which rely primarily on surface water sources - due to significant water volumes used for cooling in power engineering. Annually about 60% on average of the water abstraction in the country are used for cooling processes in energy generation, which are returned after use to the water sources.
- The pressure on water resources measured by using the exploitation index at national level is below 10%, i.e. water abstraction in Bulgaria does not cause stress to aquatic ecosystem. In the period 2000-2011 exploitation index was between 5.5% and 6.6% and in 2012 it was valued at 5.4%.



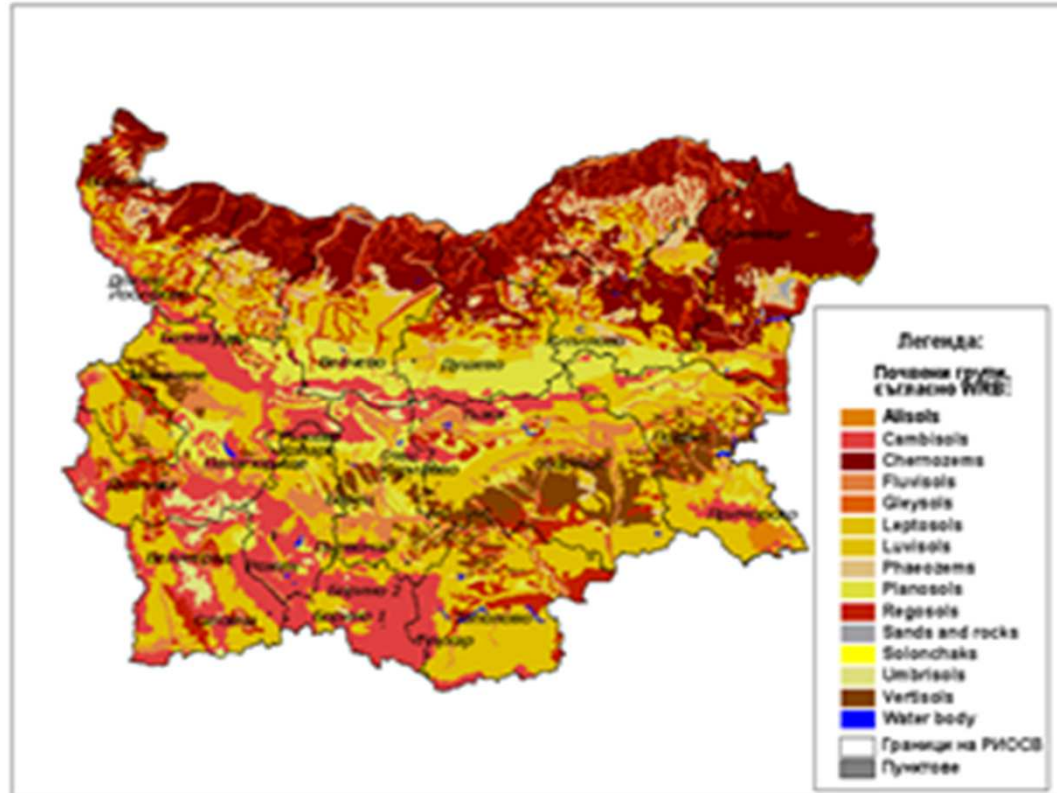
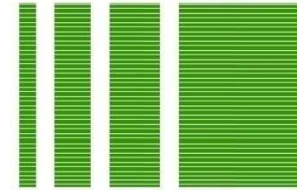
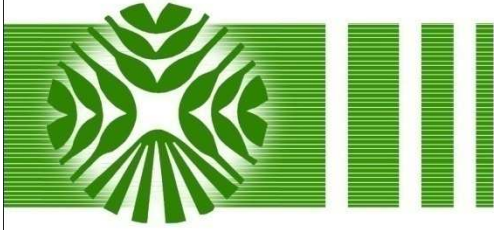
- Agricultural activity is considered to be a "diffuse source of pollution" of waters and it includes breeding of domestic animals, pastures, plowing, use of pesticides, irrigation, fertilization, sowing and harvesting. Agricultural activity also has an adverse effect on aquatic ecosystems and river basins. The impact of agriculture on surface water and groundwater may be reduced by taking the appropriate measures to reduce diffuse pollution.
- During the period 1996-2013 the tendency for improvement of the quality of surface water, observed in recent years, continued. Despite this tendency there are still certain water bodies at risk, so in order to improve their condition programs of measures have been drawn up so as to achieve a better environmental status.

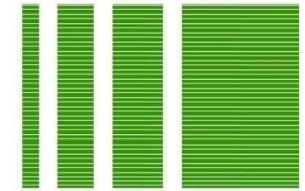


- Medium-term tendencies in the period 2006-2013 showed relative improvement of the situation in the northern coastal waters from Krapets to Galata and relative decrease in the status along the central and southern coast, from the Kamchia River to the Rezovo River. Despite the positive short-term tendencies the majority of water bodies have not yet achieved the objectives for good environmental status. The ecological status of the Kamchia River remains critical as well as in some areas in Varna and Burgas Bays.
- For the period 2007-2013, the structure of the usable land in Bulgaria was variable. In 2013, the utilized agricultural area was 45.0% of the territory of the country and 95 % of the areas with permanent agricultural use, and in comparison with 2012 it decreased by 1.2%. Uncultivated lands occupied 2.4% of the territory of the country and were reduced by 94 541 ha (26.4) in comparison with the previous year.



- In the period 2005-2013 soils in the country were in good environmental status in terms of reserve of nutrient elements/ organic matter as well as in terms of contamination with heavy metals, metalloids and persistent organic pollutants: Polyaromatic hydrocarbons (PAH), Polychloride biphenyls (PCB) and chloro-organic pesticides.
- Soil acidification is due to emissions from industrial processes and natural biochemical cycles, and with regard to arable soils we can also add to these two the one-sided fertilization (without phosphorus and potassium) with nitrogen fertilizers. A major factor for soil acidification in Bulgaria is the one-sided fertilization with nitrogen fertilizers. The share of soils with acid reaction is about 1 500 000 ha of the arable land, or approximately 11% of the arable area. The change in some of the main indicators characterizing the status of acidic soils that were found during the monitoring study in 2009 is presented in Fig. 1.





- In the period 2010-2013 the annual soil loss by water erosion remained unchanged. In comparison with the previous year the areas with erosion risk and soil losses were slightly reduced.
- In the period 2007-2013, the soil losses from wind erosion remained relatively constant. In comparison with the previous year there was a slight increase both of areas under risk of wind erosion and of areas under risk of soil loss.
- Agriculture affects the quality of soil primarily by improperly conducted agricultural activities or by absence of such. In recent years the quantities of mineral fertilizers and plant protection products have been greatly reduced compared to the years before 1990, therefore the possibilities for acidification and pollution are greatly reduced.

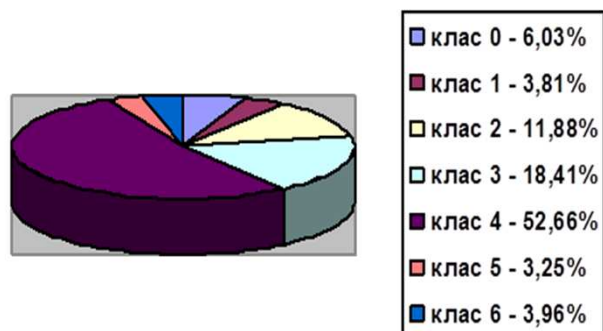
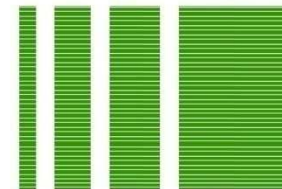
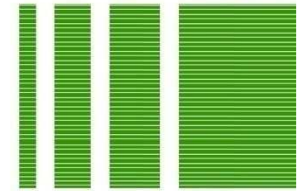


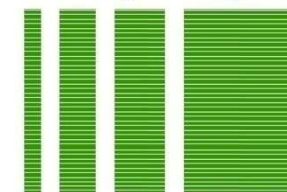
Figure 2. Susceptibility of Bulgarian soils to erosion by classes



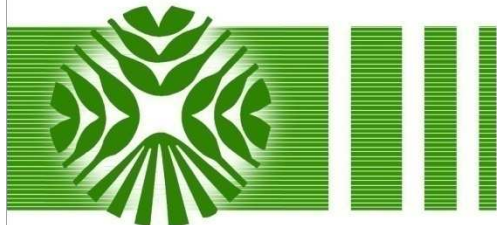
- In 2013, there was a slight increase of fertilized areas in comparison with 2012. The areas fertilized with nitrogen in 2013 were with 7% more in comparison with 2012. In 2013 the areas fertilized with phosphatic fertilizers were 11% more compared to 2012.
- In 2013 there was an increase in the amount of manure used in the production of fruit and vegetables – 30% more compared to 2012 and the areas fertilized with manure were with 23% more.
- By 31 December 2013 on the territory of the country there were 285 warehouses registered for storage of banned or unfit for use pesticides, 1960 BB cubes and 72 centralized warehouses located in 304 towns and cities. In the period 2000-2013 some positive tendencies were identified in terms of the whole process of management of warehouses for banned or unfit for use plant protection products and the areas around them.



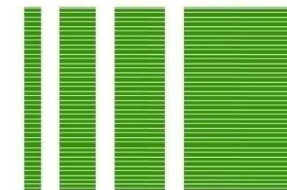
CONCLUSIONS



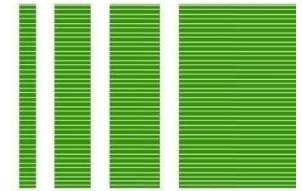
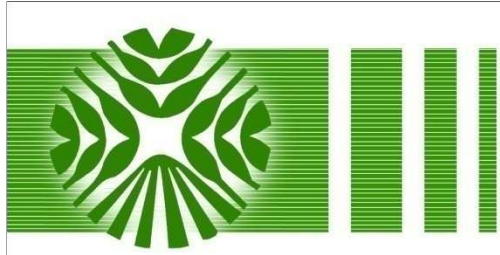
- In the very first years after its accession to the EU, Bulgaria has begun to apply the single farm payment in the form of a single payment per area (per ha), which is bound by the requirements to maintain the land in good agricultural and environmental status. In this regard, Bulgaria has prepared its minimum requirements, taking into account the specific characteristics of the region (soil and climatic conditions, structure of farms, existing practices, etc.).
- In accordance with the European plan for development of organic production Bulgaria has initiated the development of a Strategy and National action plan for development of organic farming. The following strategic objectives have been defined:



CONCLUSIONS



- Development of the internal market of organic products;
- 8% of the utilized agricultural land to be managed using the methods of organic production for 2013;
- Scientific researches in the field of organic farming to be oriented to the practice, to build a system of education, training and consulting services in the field of organic farming.
- To establish an effective system of control and certification of organic products.



THANK YOU FOR THE ATTENTION!

Teodora Stoeva, PhD.

Ekaterina Valcheva, PhD.

Agricultural University – Plovdiv