

Integrated policies and practices in soil and water management to achieve the objectives of the European Green Deal

Ognyan Kostov¹ Jechko Iordanov¹
National Association "Green Sarnitsa", Pazardzhik, Bulgaria¹
Coordination: e-mail : iordanovbg@gmail.com

Abstract : *The main task of this paper is to show the goals and possible practices in the management of key elements of the environment: soils and waters to achieve the goals set in the European Green Deal and to achieve sustainability of the EU economy. The introduced roadmap for actions outlines the main goals and requirements for increasing the efficiency of the used natural resources: soil and water by introducing the principles of the circular economy and regenerative agriculture for restoring biodiversity and mitigating the reasons for preventing their pollution.*

KEYWORDS: EUROPEAN GREEN DEAL, REGENERATIVE AGRICULTURE, PROTECTION, MANAGEMENT, -RESTORATION OF SOILS AND WATERS.

Introduction

What the European Commission's plan contains
A climate-neutral Europe

By 2050, Europe must reach zero levels of greenhouse gas emissions. The goals are set in the Climate Act, as well as in a package of change laws, such as the directives on renewable energy, energy efficiency, land use change and emissions trading.

Circular economy

A new EU action plan on the circular economy was presented again in March (1). It aims to use fewer materials for the industry and to ensure that products can be reused and recycled.

Renovation of buildings

This is one of the leading programs in the Green Deal. Renovation means increasing energy efficiency to help people reduce their heating and electricity bills. 40% of energy is consumed by homes.

Zero pollution

Whether we are talking about soil, air or water pollution - the goal is zero pollution by 2050.

Ecosystems and biodiversity

This initiative aims to implement a new forest strategy, which should increase trees in both urban and rural areas and promote non-deforested agricultural products.

From the farm to the table

The strategy aims at "green and healthy agriculture". How will the new tillage strategy affect? Sustainable food production must be ensured through the optimal use of natural and technological solutions in order to achieve better results in the field of climate and environment. Farmers must reduce and optimize the use of pesticides, fertilizers by 20% and 50% respectively. Innovative and fundamental solutions for the implementation of the strategy "From farm to fork" to achieve results with guaranteed economic efficiency, environmental efficiency and social acceptability are possible with the introduction of integrated practices for:

1. Carbon capture and retention (CCS) and in particular biological forms (BIOCCS).

The strategy also demonstrates the introduction of a "new green business model" for the application of CCS practices by farmers and foresters. These certified agricultural practices, which remove carbon dioxide from the atmosphere, retain it permanently and contribute to climate neutrality, and must be financially stimulated either through the Common Agricultural Policy (CAP) or other public or private initiatives. A similar demonstration business model, which provides farmers with a new source of income and helps other sectors to reduce carbon emissions in the food chain, is already being implemented in EU countries.

The Commission will develop a regulatory framework for carbon reduction certification based on sound and transparent reporting to monitor and verify the accuracy of the declining indicators achieved.

2. Reducing the use of pesticides: The Commission plans to reduce the use of chemical pesticides by 50%. It plans to reduce the use of more dangerous pesticides by 50% by 2030.

3. Biologically active substances: The Commission also plans to facilitate the marketing of pesticides containing biologically active substances and to review the environmental risk assessment of pesticide use.

4. Loss of nutrients: The strategy states that it is planned to reduce nutrient losses by at least 50%, ensuring that there is no deterioration in soil fertility. Fertilizer use will be reduced by at least 20% by 2030.

Transport

The EU's current target for carmakers is 95g CO₂ / km by the end of next year. New cars in Europe are expected to become zero polluted, probably by 2030. Electric cars will be stimulated by a network of charging stations.

Money for those affected by the transition
The Fair Transition Fund project should enable the affected regions to overcome the crisis situation and get out of it with significant new investments in promising areas of energy and industry. The support can be only on the basis of territorial plans, which should pledge concrete investments in modernization of productions, in switching from coal to other types of fuel or other energy models, in development of human capital.

In order to achieve a climate-neutral, ecological, just and socially oriented Europe, the need to strengthen climate action worldwide, to achieve a climate-neutral EU by 2050, in line with the objectives of The 2015 Paris Agreement, including to keep global temperature rises well below 2 °C above pre-industrial levels, and to work to keep it below 1.5 °C.

Discussion results

What problems arise from the current policies and challenges facing Bulgarian agriculture?

In line with the objectives of the CAP for rural development in the current programming period, two strategic groups of objectives have been set:

1. For the CAP and Bulgaria in the current programming period:

1.1. Increasing the competitiveness and balanced development of agriculture and the food industry;

1.2. Ecosystem protection and sustainable management, use and restoration of natural resources in agriculture and forestry and the food industry;

1.3. Prevention, adaptation and mitigation of the effects of climate change;

1.4. Socio-economic development of rural areas, social inclusion and better quality of life;

2. Problems related to the development of agriculture and climate change in our country:

2.1. Restoration of basic elements of the environment to ensure sustainable regional development of agriculture: soils (soil fertility), water resources (soil moisture, moisture retention and protection of groundwater), micro and macro flora, air.

2.2. Climate, climate change, adaptation and mitigation of climate change.

According to the representative data published in the Third National Climate Change Action Plan for the period 2013 - 2020 (2) the share of emissions generated by the agricultural sector is 10.4% of the volume of total greenhouse gases (GHG) in Bulgaria. According to the National GHG Inventory (2011), methane (CH₄) emissions are 36% of the sector's emissions (CO₂eq. / 2009) and nitrous oxide (N₂O) emissions are 64%, respectively. The main sources of emissions from the agricultural sector are:

- Agricultural soils - 56.08% ammonium gases from the use of mineral fertilizers;
- Biological fermentation in animal husbandry - 21.78%;
- Manure management - 19.34%;

The remaining 2.8% are due to burning stubble (1.68%), and rice production - 1.13%;

These main GHG pollutants in the agriculture sector are identified as a major problem for the protection of groundwater from nitrate pollution due to excessive and disproportionate use of mineral nitrate fertilizers, the formation of both nitrate vulnerable zones and ammonia emissions in the atmosphere.

For the overcoming of the above-mentioned problems related to the generated GHGs in agriculture and the protection and restoration of the main elements of the environment used in it - soils, water and atmosphere, it is necessary to implement priority measures for the sectors agriculture, land use and forestry and industry. They are grouped in two directions:

Direct measures to reduce generated ammonium emissions from the application of nitrate fertilizers and with the expected effect of preserving and restoring organic carbon in soils, improving the balance between emissions and GHG uptake by using the potential of soils, forests, pastures and meadows to play a role. of "Carbon sink" to ensure soil moisture retention, fertility and soil quality.

Indirect measures in terms of soils, capacity and ability to apply integrated practices to improve soil quality, energy saving and water saving technologies to improve sector productivity and resource efficiency.

In order to implement the measures mentioned in the second objective of the CAP, a Priority Area (PA) 5 was proposed and adopted in the Rural Development Program of the Republic of Bulgaria for the period 2014-2020 (3).

In it, the measures were aimed at promoting the efficient use of natural resources and creating conditions for the transition to a low-carbon and climate-resilient circular economy. Their implementation would lead to modern innovative approaches and cross-sectoral integrated policies in environmental management, agriculture and climate change action through a system of low-carbon practices for climate change adaptation management actions.

Unfortunately, our current national documents lack a realistic assessment and adequate measures to overcome the increasingly obvious consequences of climate change threatening the implementation of strategic tasks in the management of the national economy - ensuring the nutrition of the population, ensuring public health through management for the main components of the environment - soils, water and atmospheric air, ensuring the sustainability of ecosystems and territories.

Moreover, none of the problematic directions of the current agricultural policy mentioned in (4), (5), (6) take the necessary measures to achieve real results for the adaptation and overcoming the consequences of climate change envisaged in the above three

priority for climate action: climate change mitigation, adaptation to climate change, governance and climate-related information

The main problem arises (4), (5) (6) from the lack of innovative approaches for recovery of generated waste in agricultural holdings, processing plants and wood production and wood processing by carbon negative practices, their use of decentralized and decarbonized alternative energy generation practices. and retention and storage of organic carbon in soils (BIOCCS practices), analysis and evaluation of low-carbon innovative global practices for their feasibility in Bulgaria, construction and operation of horizontal management systems for regional adaptation to climate change for sustainable development of the regions in Bulgaria. Introducing such an approach in the management of climate change mitigation and response through feasible low-carbon practices would prevent and significantly reduce the economic damage caused by recent natural manifestations such as:

- large-scale forest fires caused mainly by burning stubble (applying negative carbon practices to restore and maintain soil fertility);
- losses - quantitative and qualitative in the production of basic cereals and especially spring crops due to permanent droughts (low-carbon practices to ensure soil moisture retention and soil fertility);
- the permanent reduction of the organic carbon content in the soils (1.29% at a critical minimum of 2% to guarantee soil fertility) in our main agricultural regions;

Particularly impressive is the inaction and unwillingness of the Ministry of Agriculture and Food to introduce a fair European principle "polluter pays" and the legal mechanisms for reimbursement of resource costs for management of a key element of the environment - water services. According to the adopted amendments to the Water Act submitted by the Council of Ministers on April 7, 2015 for consideration in the National Assembly requiring:

- In the first place in the financial organization and economic regulation in the field of water, incl. effective implementation of the "polluter pays" principle.

- Eliminate gaps in the transposition of Directive 2006/118 / EC on the protection of groundwater against pollution and deterioration, also to avoid infringement proceedings.

The above-mentioned amendments to the Water Act make payments from farmers for the use of mineral nitrogen fertilizers mandatory. This practice in European countries is defined in the measure called "nitrate footprint", which is defined and paid by the farmer on the basis of a kilogram of nitrate fertilizer per decare. The lack of an effective mechanism in place in our agricultural policies leads to both a significant increase in both nitrate pollution of groundwater and ammonium emissions polluting the air.

The lack of research and innovation, incl. and in the direction of analysis and evaluation of existing European practices, the lack of effective systems for recovery of waste from agriculture and forestry and processing industry through socially acceptable regenerative practices for protection and restoration of key elements of the environment - soil and water, erosion of The envisaged measures under Priority Area 5 of the current OPRD led to the lack of funding for training projects and introduction of low-carbon practices to mitigate the causes and consequences of climate change, introduction of control systems and monitoring of the results of low-carbon practices, preparation and development of projects. for improvement of existing normative documents and methodologies, methodical and information materials on the separate feasible low-carbon regional practices for:

- soils and soil fertility, reduction of direct pollution by partial replacement of mineral fertilizers with microbiological,

compost and biological carbon in land use, improvement of moisture-retaining characteristics of the soil for adaptation to droughts;

- utilization of biodegradable agricultural waste for restoration and maintenance of soil fertility, for restoration and increase of soil carbon content;

- efficient technologies and systems for carbonization of waste biomass for decentralized energy production and soil improvers to overcome the effects of climate change;

- cessation of stubble burning and prevention of large-scale forest fires and atmospheric pollution, creation of economically justified incentives for utilization of waste biomass, improvement of soil quality and introduction of highly efficient production of organic products;

Action needed to introduce Low Carbon practices for climate change adaptation management actions.

To this end, it is necessary to develop, demonstrate and evaluate for subsequent introduction through specific regional systems for analysis, assessment and monitoring of waste generated in these sectors in order to utilize them as resources in introducing integrated decentralized low-carbon practices for sustainable adaptation to climate change. introduction of the principles of the circular economy and regenerative agriculture, creation of conditions for realization of the goals of the European Commission for realization of the European green deal.

The specific objectives set for implementation are grouped in the development and implementation of integrated approaches to climate change mitigation at local, regional or national level, with proven feasibility for the specific region and climatic conditions and are feasible through low-carbon regional practices in the areas :

- **Agriculture** - soils and soil fertility, reduction of direct pollution by replacing mineral fertilizers with microbiological, compost and biological carbon in land use, improving the moisture-retaining characteristics of the soil to adapt to droughts;

- **Waste management** - utilization of biodegradable waste for restoration and maintenance of soil fertility, for restoration and increase of soil carbon content;

- **Renewable energy sources** - efficient technologies and systems for carbonization of waste biomass for decentralized energy production and soil improvers to overcome the effects of climate change;

- **Forests and forestry** - assessment of basic eco-services guaranteed by forests and creation of objective and assessable mechanisms for their compensation in infrastructure projects violating forest areas and use of basic eco-resources - soils and waters. Introduction of effective practices for reforestation with utilization of waste generated during their management;

- **Sustainable development of the regions** - Introduction of justified systems for sustainable development of the region and mitigation of the consequences of climate change through low carbon practices such as: stopping stubble burning and prevention of large-scale forest fires and air pollution, creating economically justified incentives for use. waste biomass for regeneration and improvement of the qualities of basic elements of the environment related to one of the main sectors for the region - agriculture, incl. soils, groundwater, guaranteeing soil fertility for the introduction of highly efficient productions in agricultural practice, animal husbandry and processing industry;

With the implementation of such systems of feasible low-carbon decentralized practices, it is possible to quickly and effectively multiply the effects in purely economic and social terms

by introducing low-carbon technologies for soil recarbonization, development of decentralized and decarbonized energy production systems. the basics for introducing an economically viable circular, low-carbon economy.

Utilization of green waste through production of biological coal and compost and their application for biological in situ reclamation of disturbed terrains by the mining industry

The road to a circular economy



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