АГРАРНІ НАУКИ ТА ЕКОЛОГІЯ

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CLIMATE-SMART AGRICULTURE: A UNKRAINIAN PERSPECTIVE

Agriculture in Ukraine is a key sector of its economy. On the territory of Ukraine there are 32 million hectares of black soil, which is one third of the arable land in all of Europe. The population of Ukraine, within controlled borders, is about 37 million people; thus, in Ukraine, there is almost 1 hectare of black soil per inhabitant of the country.

The sustainability of agricultural systems at the global level to climate change determines the prospects for food security on a global scale, and in Ukraine in particular.

The effects of climate change are already being felt today, with reduced crop yields and more frequent weather events that damage crops and livestock. Maintaining yields at their current levels and ensuring food security and nutrition will require significant investment in climate change adaptation.

Agriculture has a role to play in the transition to a low-carbon economy: agricultural production, forest loss and land-use change are now responsible for a quarter of the world's greenhouse gas emissions – and about 80% of global deforestation is caused by agriculture. If no action is taken, deforestation and forest degradation can increase substantially as farmers reclaim forested areas to compensate for reduced yields.

Agriculture is inherently subject to a number of risks and uncertainties, whether abiotic (water, light, radiation, temperature, moisture, soil), biotic (including pests and diseases) or cultural and economic. Many of these risk factors have a climate component, and most of them are associated with climate change, whether in intensity, magnitude or frequency.

The experience of recent years shows that climate-smart agricultural practices can significantly increase the productivity of this industry, increase resilience to climate change and reduce greenhouse gas emissions.

Making agriculture more productive and sustainable requires fundamentally new approaches to managing agricultural resources, including water, soil and nutrients.

Climate-smart agriculture refers to a set of proven and innovative practices that increase productivity and climate resilience, and reduce agricultural greenhouse gas emissions. Isotopic techniques track and quantify carbon, water and nutrient turnover and dynamics across agro-ecosystems to improve improved agricultural practices.

Currently, agriculture, forestry and land use are responsible for about 24% of the world's total greenhouse gases, and about 80% of the world's deforestation is caused by agriculture. In addition, the increase in food production will lead to an increase in water consumption in the coming decades by 40-50%.

To meet growing global demand between 2012 and 2050, food production will need to increase by about 50%, which opens up huge opportunities for creating new jobs in this area in developing countries.

Farmers need assistance in developing climate-smart farming practices that can adapt to and mitigate the impacts of climate change and boost food production. Improving the productivity and sustainability of agriculture requires better management of natural resources such as land, water, soil and genetic resources. These are, in particular, conservation agricultural practices that can bring a variety of positive results: reduced soil erosion, better water retention in the soil, nutrient availability for crops; accumulation of organic matter in soils; higher crop yields and animal productivity.

Climate-smart agriculture practices can help to significantly reduce greenhouse gas emissions from farm animals. These practices often provide benefits for both the agricultural economy and the environment. For example, improving the quality and balance of feed not only reduces GHG emissions from livestock and manure processing, but also increases productivity and income. Improved breeding practices and veterinary care help reduce breeding costs (the cost of animals that are selected for breeding but do not yet produce offspring, although they consume resources) and reduce associated emissions.

Agriculture can help reduce poverty, increase incomes and improve food security for the 80% of the world's poor who live in rural areas and are predominantly employed in agriculture. This poses a challenge for Ukraine to increase agricultural productivity in a sustainable manner, adapt and increase the resilience of agricultural and food security systems to climate change, and reduce agricultural greenhouse gas emissions, taking into account national and local specificities and priorities.

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LOCAL POSITIONING SYSTEM USING ULTRASONIC TRILATERATION METHOD

Accurate determination of the objects' location anywhere in the world is an important and urgent task. The development and modernization of the Global Positioning System (GPS) at all its levels occurs daily, but the problem of accurate indoor positioning of moving objects cannot be completely solved using satellite navigation technology. The organization of a productive workflow in the modern world is in dire need of constant accumulation and analysis of a huge amount of data, among which an important role is played by the location of the working staff at any given time.

Many companies and enthusiasts are looking for the most efficient Local Positioning System (LPS). There are a large number of developments of such systems based on various technologies, the main of which are: radar, optical, ultrasonic [1].