cnn.gr, 22/5/21

At the end of last February, 15 stakeholders from five European countries (Greece, Italy, France, Germany and Serbia) submitted their own proposal - participation in the Horizon Award of the European Innovation Council (EIC), on the Early warning for the epidemics.

The proposal was submitted under the coordination of the National Observatory of Athens, the company "Ecodevelopment" from Thessaloniki and the Department of Physics of the University of Patras, is called EYWA: EarlY WArning System for vector-borne diseases and its content shows that the European Commission is now throwing into battle for future epidemics the most important of its state-of-the-art weapons, including Artificial Intelligence.

EYWA is an early warning system for mosquito-borne diseases for which all estimates are that in the upcoming decades they will increase and spread to more European countries than are currently present.

A significant part of the proposal submitted by the 15 collaborating European stakeholders is based on the know-how acquired in Central Macedonia, the region that first implemented mosquito control programs in Greece and Southeastern Europe, successfully encountered (2010) the first epidemic of the West Nile Virus (WNV) in the Continent and is so far an indicator for other European countries to reduce its impact based on its experience.

During this recent webinar organized by the National Observatory of Athens (350 scientists from 40 countries), Prof. Dr.Jonas Schmidt-Chanasit of the Bernhard Nocht Institute for Tropical Medicine of Germany, referred to this accumulated know-how but also to the full utilization of mega data, saying:

“I am always fascinated when I see the data from [Central] Macedonia and the way in which large-scale data analysis methodologies are used, including Artificial Intelligence. I have to admit - said the German professor - that we are light years away from these possibilities [in Germany], and we really want to work [in] EYWA to increase the chances of being faster and reacting properly as we see what is happening in Greece”.

The praise of the German expert to the institutions and those involved in the treatment of mosquito-infectious diseases, does not concern an attitude of scientific ... courtesy but corresponds to reality. Greece and especially Central Macedonia with the use of state-of-the-art technology successfully faces every summer small or even larger outbreaks of the West Nile virus. In the last two years, the second most populous region of the country, has raised the bar of protection even more, having added in the framework of the research program EWSMD (Greek-German cooperation), a risk prediction system for the West Nile virus with which it analyzed data from thousands mosquito breeding sites, occurrence of WNV cases, meteorological data, land uses from all regional units.

The announcement for the EIC Prize Horizon was made in early 2018, at least one year before the outbreak of the Sars CoV-2 pandemic, which shows that prevention of future epidemics

was already high in the EU's political agenda. "Early Warning" is now an international political and legal imperative, an obligation first announced in the 1992 Rio Declaration.

The coronavirus pandemic may have overshadowed European vector-borne diseases mitigation, but European healthcare providers saw the importance of early warning systems multiply in 2020 due to the rapid transmission of Sars CoV-2. In addition, more and more people are recognizing that climate change is beginning to change the landscape, favoring harmful insects to grow and "conquer" new European regions year after year.

Recent statistics show that more than 80% of the world's population lives in areas at risk of at least one major communicable disease (causing 17% of all infectious diseases) and, according to the World Health Organization, are responsible for more than 700,000 deaths worldwide / year. Mosquitoes are the protagonists of these vectors and the most important diseases transmitted by them in Europe are: the (well known in Greece) West Nile Virus - which is now endemic in much of Europe and is associated with the common mosquito -, malaria transmitted by mosquitoes (Anopheles) and Chikungunya disease, dengue fever and Zika which can be transmitted to Europe by the *Aedes albopictus* mosquito, known as the "Asian Tiger".

In the last two decades, specific actions and practices have been adopted to control these diseases, every year from a few to many cases occurring in different European countries and therefore the launching and operation of an early warning system - and with a view to climate change – has become today, in the midst of the pandemic, extremely important.

"At EYWA", as Dr. Spiros Mourelatos, President of "Ecodevelopment SA" told Athens New Agency, "the most important players in Europe are involved regarding the production and analysis of raw data and the control of mosquitoes from Greece, Serbia, Italy, France and Germany ". During the last 10 years in these countries, after all, 40% of all West Nile Virus cases in Europe have been recorded.

The 15 partners of the consortium have long experience in remote sensing, disaster risk reduction, crisis management, entomological surveillance and mitigation of vector-borne diseases, as well as specialization in big data analysis technologies and machine learning methodologies.

From the use of EYWA so far, multiple benefits have already emerged with the most important being the systematic and reliable assessment of epidemiological risk for WNV infection and the detection of areas of increased vulnerability in the event of imported non-endemic diseases such as malaria, Chikungunya, dengue fever and Zika.

EYWA includes two basic models for predicting the abundance of mosquitoes used last year in Macedonia, Thessaly, Western Greece, Crete and the Veneto region of Italy and two risk prediction models for the transmission of WNV for use by the public health services of the five Regions. The forecasts in these five Regions have been integrated into the operational planning of mosquito control programs with very satisfactory results and today, the direct aim of the EYWA system is to extend the use of forecasts to eight European regions with the addition of Vojvodina of Serbia, Occitanie of France and Baden-Württemberg of Germany.