

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland
23-25 January 2017**

Contribution of Bulgaria

to the CSTD 2016-17 priority theme on ‘The role of science, technology and innovation in
ensuring food security by 2030’

DISCLAIMER: The views presented here are the contributors' and do not necessarily reflect the views and position of the United Nations or the United Nations Conference on Trade and Development.

**United Nations Commission on Science and Technology for Development (CSTD)
Inputs for CSTD 2016-17 Priority Themes**

BULGARIA

The role of science, technology and innovation in ensuring food security by 2030

SOURCE: Bulgarian Academy of Science

The innovative approaches for Bulgaria are:

1. After long pressure by various stakeholders it was agreed, albeit slowly, that rather than being disposed of food should be better distributed to the poor. On 27 October 2016 the Parliament voted to exempt the donation of close to expiry date food from VAT. It is assumed that this will motivate large food chains to donate food rather than send it to landfills.

According to the Bulgarian Food Bank each year over 670 thousand tons of food are destroyed. At the same time, 21.2 % of Bulgarians, or around 1.54 million people, live in poverty. Further changes were introduced to the law governing food and food banks. However, these regulatory changes should be subject to monitoring in order to see how they are implemented and what further changes are needed in order to ensure actual access to food for the poorest in the country.

2. The social economy and social enterprises are an important part of the necessary social innovations. The Ministry of Labor and Social Policy in Bulgaria has an advisory group on social economy, composed by different stakeholders. This contributes to promoting activities in the field and a gradual ‘normalisation’ of the practices in this respect. At the same time, the development of a legal framework in this area is faced with numerous problems, and in particular the absence of political will to develop a law that should clearly separate the organisational units of the social economy from other economic operators. Particularly problematic is the empowerment of members of these organizational units on the basis of the principle “one person, one vote”. In this context a discussion panel of the regulatory framework of the social economy would be very useful.

3. International scientific networks which can contribute to improving the social dimensions of development in the social field, in which Bulgaria also participates, are gradually being built. Examples of such systems are: Adequate minimum income (EMIN); Social Economy and Social Enterprises (EMES), etc.

The mission of the Institute of plant physiology and genetics (IPPG) to the Bulgarian Academy of Sciences is linked to conducting research that is contributing to the resolution of global issues such as feeding the population in the ongoing adverse climatic changes, which also sets out the main priorities.

— creation of new plant forms for the arable sector, food processing and pharmaceuticals industries, health and environmental protection.

— research into the physiological and biochemical bases of Regulation of the plant’s metabolism in plants and safeguard mechanisms that help to overcome the negative effects of the environment and to increase their resilience.

— studies on the organization and functioning mechanisms of the researched structures in order to characterize the enrichment of genetic resources and their use for the enhancement of economic importance for the country’s plant species.

To identify environmentally sustainable solutions for feeding the populace, the IPPG is testing plants both at the molecular level as well as their relationship with environmental air, soil and water. The resulting scientific data concerns raising the productivity of plant by optimising their water exchange mineral nutrition, maintaining an optimal environment for active symbiotic relationships with micro-organisms, minimizing adverse effects on the environment, increasing

resilience photosynthesis through phytohormones and plant growth regulators. The project is developing and exploring new genotype cultivars with improved food and biological properties — maize (*Zea mays* L.), tobacco (*Nicotiana tabacum* L.), cultural sunflower (*Helianthus annuus*), tomato (*Solanum lycopersicum* L.) and pepper (*Capsicum annuum* L.). Assessment shall be performed of the genetic diversity of varieties of wheat (*Triticum aestivum* L.) with a high tolerance of drought, leaf pathogens and increased nitrogen efficiency.

New innovative biotechnologies are being encouraged, such as seaweed biomass production, protecting and enhancing biodiversity through a complex survey of valuable medicinal herbs (oregano, white oil, the valerian, peppermint, thyme, sage), Bulgarian endemic and rare species that are critically endangered or new species (non-traditional for our country, gooseberry Stevia, echinacea, tayberries) in favour of agriculture, the pharmaceutical, cosmetic and food industries. Genes that are key to increase the tolerance of crops are being identified to stress environmental conditions through the use of protein and chromosomal DNA markers and examined the regulation of gene expression.

Examples of innovative developments over the last years:

— development of screening methods for assessing the genetic types of wheat arid - resistance selection, to improve the effectiveness of nutrition, water exchange and quality of the grain.

— the genetic resources of common wheat (*Triticum aestivum* L.) in Bulgaria have been characterized and a collection of more than 200 old and modern wheat varieties and breeding lines has been made. The test material is assessed on important business signs such as maturity period, height, productivity, field resistance to disease and pests

— a unique sunflower line has been created, resulting in hybridisation through the transfer of genetic material between cultural sunflower *Helianthus annuus* and medical plant *Echinacea purpurea*, followed by targeted selection and breeding.

— a pepper line (безантоцианова капия) with a high dry matter content of lycopene, vitamin C, complex and reducing sugars with тобамовируси краставичномозаечния virus resistance.

— a tomato variety has been created with a “non-traditional” form and golden yellow colour of the fruit, unusual for our food containing nutrients, absent in red tomatoes.

Agricultural Academy provides information about the role of science, technology and innovation to ensure food security by 2030:

The Agricultural Academy (AA) is an organization for scientific, applied, support and ancillary activities in the field of agriculture, helping with the realization of the strategic objective of ensuring food security of the country, preservation of natural resources and improving the quality of life.

In AA operate 562 scientists carrying out research projects related to food security in the following major areas: sustainable use of natural plant resources, animals, soil and water and reduce the adverse impacts associated with climate change; maintenance of genetic resources and creating new, high-yielding varieties and animal breeds, well adapted to changing climatic and economic conditions; develop healthy foods to improve the length and quality of life; provision of certified and quality seeds, seedlings and breeding material.

The strongest advantages of the research institution (AA) for sustainable development are:

- The integration of all functional units of the innovation process in agriculture from idea to research product
- A regional network of institutes and experimental stations engaged in scientific, applied and consultancy located geographically in all regions of the country.

The scientific projects are funded through several sources:

- Funds from the budget subsidy (institutional support)

Project proposals are evaluated and accepted by expert councils, composed of authoritative academic rank for a term of four years and are in accordance with previously adopted long-term priorities. Projects in the selection and maintenance of genetic resources have a long-term duration and their continuity is ensured. Much of the projects result with the creation of a new research product - a new variety, new technological solutions or integrated technologies for

growing different crops or animals that can be directly embedded in agricultural production. There are 345 scientific products owned by the institutes and experimental stations of the AA which have certificates for protection from the Bulgarian Patent Office.. Just recently in 2016 8 new varieties of different cultures and 2 breeds received new certificates.

In 2016, the structural units of the SAA participated in 130 projects - 38 in plant breeding, 31 in animal husbandry, 46 in the field of soil science, agricultural technology and the protection of plants, 10 in the field of safety and quality of food and 5 the field of management of agricultural production. These projects are funded through budgetary subsidy provided by MAF and through their own income provided by the sale of scientific products.

- **Projects funded by Bulgarian competition programs**

Opportunities to receive external funding for research projects in the field of food security in national competitive programs are not many. The National Science Fund finances a relatively small number of projects per year in all scientific fields, and each time between 3 and 5 of the project proposals have participation of researchers from the AA in scientific fields related to food security. These projects are usually implemented over a period of three years.

Despite the small number, the activity of researchers in the preparation of the proposals is significant. For example for the competition session NSF in 2016 were prepared 31 proposals for fundamental research, 4 - for Young Scientists Competition and 9 for the competition for bilateral cooperation with China.

- **Projects funded by international competition programs**

Researchers from the Academy also apply to calls for proposals from international competition programs for the development of projects related to the priority food security. In the last year the AA participated in 43 such projects - 3 projects under the European Programme for Plant Genetic Resources, 17 projects under the "Horizon 2020" programme, 2 projects of the International Atomic Energy Agency and 21 projects in various Operational programs and international organizations and institutions. These projects typically last three years.

The scientific results of the projects are published in Bulgarian and international scientific journals. The Agricultural Academy publishes five scientific journals: Bulgarian Journal of Agricultural Science, Plant Science, Animal Science, Soil Science Agrochemistry and Ecology, Economics and Management of Agriculture. Some of the journals are referred to and indexed by global data bases and from this year have open access.

The practical research results reach farmers and other persons stakeholders through open days and seminars. In 2015, 67 demonstration fields and visits to farms were set up, where 50 open days and meetings of teams of scientific units with farmers took place. During these events information on the latest plant varieties, animal breeds and innovation in the technological aspects of farming was presented. During the last year 94 scientific and practical conferences were held, as well as seminars, symposia, round tables, etc. On these forums problematic issues of modern agriculture were discussed including such related with food security. For dissemination brochures, newsletters, flyers were printed and videos were created in total circulation of 20,503 copies. Scientists participated in 130 radio, 98 television shows and featured in 241 pgs. press reports.

The envisaged amendments to the Law on AA will ensure greater sustainability of research in the field of food security, faster transfer of results to the agricultural business and will contribute to the generation of innovative policies on agriculture and food and better jobs with local authorities towards reducing imbalances in regional development.

Agricultural Academy provides information about the role of science, technology and innovation to ensure food security by 2030:

The Agricultural Academy (AA) is an organization for scientific, applied, support and ancillary activities in the field of agriculture, helping with the realization of the strategic objective of ensuring food security of the country, preservation of natural resources and improving the quality of life.

In AA operate 562 scientists carrying out research projects related to food security in the following major areas: sustainable use of natural plant resources, animals, soil and water and reduce the adverse impacts associated with climate change; maintenance of genetic resources and creating new, high-yielding varieties and animal breeds, well adapted to changing climatic and economic conditions; develop healthy foods to improve the length and quality of life; provision of certified and quality seeds, seedlings and breeding material.

The strongest advantages of the research institution (AA) for sustainable development are:

- The integration of all functional units of the innovation process in agriculture from idea to research product
- A regional network of institutes and experimental stations engaged in scientific, applied and consultancy located geographically in all regions of the country.

The scientific projects are funded through several sources:

- Funds from the budget subsidy (institutional support)

Project proposals are evaluated and accepted by expert councils, composed of authoritative academic rank for a term of four years and are in accordance with previously adopted long-term priorities. Projects in the selection and maintenance of genetic resources have a long-term duration and their continuity is ensured. Much of the projects result with the creation of a new research product - a new variety, new technological solutions or integrated technologies for growing different crops or animals that can be directly embedded in agricultural production. There are 345 scientific products owned by the institutes and experimental stations of the AA which have certificates for protection from the Bulgarian Patent Office.. Just recently in 2016 8 new varieties of different cultures and 2 breeds received new certificates.

In 2016, the structural units of the SAA participated in 130 projects - 38 in plant breeding, 31 in animal husbandry, 46 in the field of soil science, agricultural technology and the protection of plants, 10 in the field of safety and quality of food and 5 the field of management of agricultural production. These projects are funded through budgetary subsidy provided by MAF and through their own income provided by the sale of scientific products.

- Projects funded by Bulgarian competition programs

Opportunities to receive external funding for research projects in the field of food security in national competitive programs are not many. The National Science Fund finances a relatively small number of projects per year in all scientific fields, and each time between 3 and 5 of the project proposals have participation of researchers from the AA in scientific fields related to food security. These projects are usually implemented over a period of three years.

Despite the small number, the activity of researchers in the preparation of the proposals is significant. For example for the competition session NSF in 2016 were prepared 31 proposals for fundamental research, 4 - for Young Scientists Competition and 9 for the competition for bilateral cooperation with China.

- Projects funded by international competition programs

Researchers from the Academy also apply to calls for proposals from international competition programs for the development of projects related to the priority food security. In the last year the AA participated in 43 such projects - 3 projects under the European Programme for Plant Genetic Resources, 17 projects under the "Horizon 2020" programme, 2 projects of the International Atomic Energy Agency and 21 projects in various Operational programs and international organizations and institutions. These projects typically last three years.

The scientific results of the projects are published in Bulgarian and international scientific journals. The Agricultural Academy publishes five scientific journals: Bulgarian Journal of Agricultural Science, Plant Science, Animal Science, Soil Science Agrochemistry and Ecology, Economics and Management of Agriculture. Some of the journals are referred to and indexed by global data bases and from this year have open access.

The practical research results reach farmers and other persons stakeholders through open days and seminars. In 2015, 67 demonstration fields and visits to farms were set up, where 50 open days and meetings of teams of scientific units with farmers took place. During these events information on the latest plant varieties, animal breeds and innovation in the technological aspects of farming was presented. During the last year 94 scientific and practical conferences were held, as well as seminars, symposia, round tables, etc. On these forums problematic issues of modern agriculture were discussed including such related with food security. For dissemination brochures, newsletters, flyers were printed and videos were created in total circulation of 20,503 copies. Scientists participated in 130 radio, 98 television shows and featured in 241 pgs. press reports.

The envisaged amendments to the Law on AA will ensure greater sustainability of research in the field of food security, faster transfer of results to the agricultural business and will contribute to the generation of innovative policies on agriculture and food and better jobs with local authorities towards reducing imbalances in regional development.