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Reintroduction of genetic resources from cereal crops to achieve increased resilience in the food chain and improve the livelihood of farmers in Serbia and Bulgaria – GRAINEFIT

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What is the project focused on?

The negative effects of climate change on food production from small-grain cereals (wheat, barley, oats, rye), food security and fertilization, the reduction of on-farm genetic diversity, unemployment and the mass migration of young people to the cities represent serious problems in the rural areas of Serbia and Bulgaria, particularly for small-scale farming households. Despite the growing demand on the market for local products with good

nutritional value and fewer allergens, farmers' awareness of the benefits of local varieties is insufficient. There is a lack of effective coordination in establishing partnerships between farmers' associations, researchers, national services and civil communities for the development of crops that are resilient to climate change and of new business opportunities to improve farmers' livelihoods.

What will we do?

Local varieties of small-grain cereals adapted to regional conditions will be collected and multiplied from farms, gene banks and national institutes. The seeds will be distributed among the most vulnerable farmers for the conservation and re-introduction of local varieties, diversification of agricultural production and participatory selection of climate-resilient crops with the involvement of both women and men farmers. Local farmers will be provided with scientific support, training and know-how, which will facilitate decision-making. Field days at municipal level will be organized with the participation of national agricultural services and research institutes to promote the use of small-grain genetic resources on farms in line with traditional agricultural practices. Local small-grain cereals will be evaluated for agronomic traits, resistance to diseases and drought, and their genetic (DNA level), nutritional and technological profiles will be studied. Through workshops for sharing additional practices, expertise and experience, research and institutional cooperation will be strengthened. Seminars on the labelling of newly developed products, a round table and a meeting with the business sector will be organized, and a comprehensive guide will be developed and disseminated among stakeholders interested in small-grain cereals in order to support vulnerable farmers in generating additional income and coping with poverty, finding their market niche, accessing services and financial means, establishing partnerships, and producing and selling a variety of traditional products with a distinctive label.

What are we expected to achieve?

This project will bring direct benefits to 40 women and men farmers by training them in the reintroduction, conservation, sustainable use and management of small-grain genetic resources adapted to climate change. At least 20 farmers in vulnerable rural areas, including the younger generation, will be supported in generating additional income and improving their livelihoods through training on adding value to local varieties and marketing traditional cereal products with a distinctive label. Farmers will be supported in joining cooperatives and farmers' organizations, and their cooperation with research institutions, agricultural advisory services, state agencies and other stakeholders will be improved. In order to ensure farmers' access to varieties with higher yield, good adaptability and quality under adverse climatic conditions, 90 varieties of common winter and durum wheat will be evaluated for important agronomic traits and disease resistance in experimental fields and

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subsequently analysed using molecular markers. Of these, 50 varieties will be tested for drought tolerance under laboratory and field conditions, and 20 will be analysed for technological quality and nutritional value. This will make it possible, at the initial stages of breeding, to select and propose 10 of the best genotypes for further improvement.

The project is expected to also benefit at least 1000 farmers through the provision of seeds from the evaluated genetic resources, which will be promoted to the public in demonstration fields and during field days in agricultural services and research institutions. Innovative approaches and food technologies will be applied to improve the performance of two end products based on local small-grain cereal varieties. Information on the nutritional profile, technological quality of different local varieties, as well as their agronomic traits and suitability for cultivation in a given region, will contribute to a significant improvement in the nutrition of vulnerable communities and farmers. The project will have a positive impact on poverty reduction by strengthening equity, inclusion and the capacity of rural communities to meet the continuously growing demand, especially from the urban population, for quality food with good nutritional properties, produced on local farms and in a traditional way.

The project will contribute to the development of human resources and the building of knowledge and skills, particularly among young scientists and researchers, through training, knowledge transfer and exchange of experience. The multidisciplinary consortium is expected to establish long-term regional partnerships between leading research institutions in Serbia and Bulgaria, based on complementary expertise, to identify and provide climate-resilient crops rich in nutrients and with good technological properties, with an emphasis on food safety. The four national institutions will also work together to strengthen plant genetic resources information systems, thereby contributing to the Global Information System by providing access to all phenotypic and genotypic data on the studied germplasm. The project results will raise awareness of the importance of the International Treaty on Plant Genetic Resources for Food and Agriculture among researchers, national services, civil communities and farmers, will strengthen activities related to its implementation, visibility and the increase of funding for the sustainability of project interventions.

Who will benefit the most?

Direct benefits during the implementation of the project will be received by: 40 small vulnerable farmers with 50% participation of women; 5 local farmers' associations; 5 civil society organizations supporting sustainable agriculture and equality between ethnic groups and genders; 2 organizations preserving local traditions and foods; 3 small processing enterprises; 5 agricultural services; 25 scientists involved in genotyping, technological

quality analyses, supporting farmers and linking them with other stakeholders; and 2 national gene banks. Indirect benefits include: 1000 farmers through trainings, seminars and field demonstrations; 10 young women scientists; 5 policymakers at regional and national level; 2 trading companies; and the general public.

For more information

Keywords: resilient crops, conservation, farmers' associations, genetic resources, gender equality, molecular markers, nutritional and technological profile, breeding, small-grain cereals, Triticum, women farmers

Project coordinator: *Institute of Field and Vegetable Crops in Novi Sad, Serbia*

Participating countries: *Serbia and Bulgaria*

Location: *Northern and Central Serbia, Central Southern and South-Eastern Bulgaria*

Target crops: *wheat, barley, oats, rye*

Additional sponsors: *Directorate for National Reference Laboratories, Ministry of Agriculture, Forestry and Water Management, Republic of Serbia*

Partners: *1. Institute of Food Technology in Novi Sad, Serbia*

2. AgroBioInstitute in Sofia, Bulgaria

3. Institute of Plant Genetic Resources in Sadovo, Bulgaria

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