



Food and Agriculture Organization
of the United Nations



FIELD-LEVEL TESTING AND AGRONOMIC EVALUATION OF NEW SWEET CHERRY VARIETIES IN SUB-MEDITERRANEAN HERZEGOVINA

March 2025

SDGs:



Country:

Bosnia and Herzegovina

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FAO Contribution:

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Implementing Partners

Ministry of Foreign Trade and Economic Relations (MoFTER); Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina; and Ministry of Agriculture, Forestry and Water Management of Republika Srpska.

Beneficiaries

Farmers, extension services and government institutions involved in the sweet cherry value chain.

Country Programming Framework (CPF) Outputs

CPF and United Nations Sustainable Development Cooperation Framework Priority 1: Sustainable, resilient and inclusive growth. Outcome 1: By 2025, people benefit from resilient, inclusive and sustainable growth ensured by the convergence of economic development and the management of environment resources. Output 1.3: By 2025, rural communities, including smallholder farmers, fisher folk, women and youth and other vulnerable groups, and the private sector agro-enterprises have the capacities to apply sustainable growth principles for inclusive economic development and decent jobs.



BACKGROUND

Sweet cherry (*Prunus avium* L.) is an important stone fruit growing worldwide in temperate climatic zones, the fruits of which are consumed both fresh and in processed form. The fruit has high medicinal properties and is a good source of antioxidants. Cherry cultivation has a long tradition in Bosnia and Herzegovina, mainly because of the favourable climatic conditions in the region. The cherry industry has the potential to contribute to increased employment, rural livelihoods, food security, rural growth and exports.

In 2019, the production of sweet cherries in the country was officially estimated at 9 379 tonnes from a total planted area of 727 ha, of which around 680 ha were under harvested. In 2020, Bosnia and Herzegovina exported 32 tonnes of sweet cherries, a reduction of 27 percent from the previous year export levels. Bosnia and Herzegovina's stake of the world's total cherry exports in 2019 was less than one percent.

According to FAOSTAT data, Bosnia and Herzegovina is a net importer of sweet cherries in terms of volume, with import volumes of 60 tonnes in 2020.

In Bosnia and Herzegovina over 100 varieties of sweet cherry are grown, predominantly in the southern area of Herzegovina. Despite the favourable conditions and high export potential for cherry cultivation, sweet cherry production is characterized by low productivity. The principal reasons include insufficient technical knowledge of cherry production and management, a lack of suitable varieties, and the prevailing use of old cultivars and rootstocks.

FAO was approached by MoFTER for technical support and cooperation to increase the production and improve the productivity of sweet cherry in the country. The project aimed to strengthen technical capacity in cherry production and management among national experts from the Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina, and the Ministry of Agriculture, Forestry and Water Management of Republika Srpska, as well as that of the consortium of institutional stakeholders and farmers. The project would include a review of the cherry industry, focusing on the enhancement of cherry productivity by selecting varieties adapted to the country's climatic conditions and the adoption of good management practices. It would establish pilot demonstration plots with improved local and imported cherry varieties for assessment and agronomic evaluation, and provide a comparative analysis of phenological, morphometric and pomological traits with recommendations of the best varieties for registration and a comprehensive breeding programme. It would also provide training for national experts and develop technical guidelines and relevant extension materials for future training.

IMPACT

The project has successfully introduced technical solutions that were new to the beneficiaries and stakeholders, leveraging expertise that would not otherwise have been accessible. The field testing of new sweet cherry varieties and the development of a technical manual and training programmes have provided stakeholders with cutting-edge practices and technologies in orchard management and berry production, addressing key challenges faced by local farmers and offering innovations that had not been widely known or implemented in the region. The project's technical expertise played a critical role in transferring this advanced knowledge, which has significantly enhanced local capabilities and improved production practices.

ACHIEVEMENT OF RESULTS

The project successfully achieved all its expected outcomes, demonstrating significant progress in strengthening the sweet cherry production sector. The field testing of new cherry varieties was completed, providing valuable insights into optimal cultivation practices under local conditions. Capacity-building initiatives enhanced the knowledge and skills of stakeholders, including farmers, extension services and government institutions, ensuring the sustainable adoption of innovative practices. In addition, the development of a technical manual and value chain assessment supported evidence-based decision-making and sector development. These accomplishments collectively contributed to improved productivity, stakeholder coordination and sustainable agricultural practices.

All the expected outputs of the project were successfully delivered, reflecting effective planning and implementation. Field trials were completed, providing critical data on the performance of new varieties under local conditions, including yield, quality and resilience. Training programmes and workshops equipped stakeholders - farmers, extension services and government institutions - with advanced knowledge and practical skills in modern cultivation and orchard management. A comprehensive technical manual, offering clear guidance on best practices for sweet cherry production, was designed and distributed. A detailed assessment of the sweet cherry value chain was also prepared, identifying opportunities and challenges to support strategic planning and market development. High-quality cherry seedlings, supporting pillars and irrigation equipment were procured and installed at pilot demonstration sites to showcase innovative farming practices. Together, these outputs laid the foundation for sustainable development in the sweet cherry sector, achieving the project's goals and benefiting all relevant stakeholders.



IMPLEMENTATION OF WORK PLAN AND BUDGET

Most project activities were implemented within the planned timeframe. Key milestones, such as the field testing of sweet cherry varieties, capacity-building workshops and the development of the technical manual, were completed as scheduled. The procurement and installation of equipment at pilot demonstration sites were also carried out without significant delays.

All project activities were implemented within the planned budget, demonstrating effective financial management and resource allocation. Any minor budget adjustments were managed within the overall financial framework, ensuring that the project objectives were achieved without exceeding the allocated resources.

Risks to the project were actively managed through regular updates to the risk log and consistent monitoring of progress. A proactive approach was taken to identify, assess and mitigate risks, ensuring minimal disruption to project implementation.

Project performance in managing environmental and social risks was highly effective. Such environmental risks as potential soil degradation or overuse of resources were mitigated through the promotion of sustainable farming practices. The field testing of sweet cherry varieties was conducted with careful consideration of local ecological conditions to ensure minimal environmental impact. Social risks, such as unequal access to project benefits or potential conflicts among stakeholders, were addressed through inclusive engagement and capacity-building activities.

FOLLOW-UP FOR GOVERNMENT ATTENTION

Continued investment, policy support and stakeholder engagement will be critical to fully embed and maintain project outcomes over the long term.

SUSTAINABILITY

1. Capacity development

The relevant policies and legal frameworks in place or under development provide a solid foundation for sustaining the outcomes of the project. National agricultural policies and strategies emphasize the promotion of sustainable farming practices, the adoption of innovative technologies and the diversification of agricultural production, all of which align with the project's goals. Ongoing efforts to harmonize legal frameworks with European Union standards in agriculture and rural development also support the integration of the advanced practices introduced. The inclusion of sweet cherry production in strategic plans for rural development and value chain promotion further strengthens the sustainability of project outcomes.

The project is well integrated into organizational structures that are likely to sustain its results beyond its duration. The involvement in project activities of key government institutions, such as ministries of agriculture, extension services and agricultural cooperatives, has strengthened institutional knowledge and commitment. Collaboration with universities and research institutions has further embedded the project in networks focused on agricultural innovation and knowledge transfer, while the provision of technical manuals and the establishment of demonstration sites have created long-lasting resources for farmers and stakeholders. Strong collaboration was also established with farmers and non-governmental organizations (NGOs), creating a supportive network to sustain the project's results.

The project had a well-structured exit strategy and clearly defined follow-up actions to ensure the sustainability of its results. Activities were designed with a focus on transferring knowledge and tools that would remain accessible to stakeholders after project completion. Project alignment with national agricultural policies and legal frameworks ensured that outcomes were reinforced by the broader institutional environment, with commitments to scaling up successful interventions.

2. Gender equality

The project successfully met the needs and priorities of both women and men beneficiaries. Efforts were made to ensure that activities were inclusive, addressing the specific challenges faced by both groups in the agricultural sector. Capacity-building was designed to be accessible and relevant to all stakeholders, with equal participation for both women and men. The project also ensured that women were actively engaged in workshops and field testing. In addition, the project considered gender-specific needs in the provision of technical support, ensuring that both women and men farmers were equipped with the skills and knowledge to improve productivity and adopt new technologies. Finally, the project made significant efforts to ensure that both women and men benefited equitably from its results, with particular attention paid to the objectives of the FAO Policy on Gender Equality.

3. Environmental sustainability

The project mainstreamed environmental sustainability across its activities. Key efforts to minimize environmental impact included the promotion of climate-resilient sweet cherry varieties, the introduction of advanced irrigation systems, and the adoption of integrated pest management (IPM) practices and best practices in orchard management.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

The project contributed positively to achieving human rights by integrating such key principles as: active participation from a wide range of stakeholders; clear lines of accountability; equal access for both women and men to all activities, resources and opportunities; transparency in all operations; promotion of the dignity of stakeholders through capacity building and improved livelihoods; empowerment through the provision of knowledge, skills and resources; and alignment with national agricultural policies and legal frameworks. Through these efforts, the project not only contributed to economic development but also promoted human rights principles by ensuring inclusive, transparent and accountable processes, while empowering communities and reinforcing their rights and obligations in the agricultural sector. The project also contributed significantly to the implementation of the Right to Food Guidelines adopted by FAO in 2004 by focusing on improving access to sufficient, nutritious food through sustainable agricultural practices.

5. Technological sustainability

The technology introduced by the project was highly appropriate and flexible, tailored to the specific needs of local farmers and agricultural conditions. Several factors contributed to the success of the technology. The project introduced sweet cherry varieties that were specifically selected for their resilience to local climate conditions and provided modern, efficient irrigation systems designed to optimize water use. Technologies related to IPM and organic practices were introduced to reduce dependency on chemical inputs. The training provided ensured that farmers were equipped with the knowledge and skills required to effectively use the new technologies, which were designed to be scalable and replicable, allowing them to be implemented on small- and medium-sized farms across different regions. Overall, the technologies introduced were highly relevant to the local agricultural context and adaptable to the needs and capacities of the target beneficiaries, ensuring their successful integration into farming practices.

The project also made significant contributions to the development of local knowledge, capacity, resources and good practices, with a focus on sustainable agriculture and innovation.

6. Economic sustainability

The project has successfully contributed to the mobilization of additional financial resources for the agricultural sector, particularly in relation to the sweet cherry production subsector.

The demonstration of successful field testing of sweet cherry varieties and the adoption of sustainable practices have led to an increased willingness to invest in the agriculture sector. The project's alignment with national agricultural priorities has encouraged government institutions to allocate additional resources to support these initiatives. The successful outcomes of the project have made a strong case for continued government funding to scale up similar interventions.

The products and services developed by the project were designed to be accessible and affordable to beneficiaries and stakeholders, taking into consideration their financial capacity and local economic conditions. The technologies and practices introduced were designed to be implemented on small- and medium-sized farms without significant additional financial strain. As the model becomes more widely adopted, costs could decrease through economies of scale, making the solutions more affordable for a broader group of beneficiaries.



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DOCUMENTS AND OUTREACH PRODUCTS

- ☐ Radovic, M. *Technical Manual on Sweet Cherry Production.*



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ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Increased sweet cherry production and productivity in Bosnia and Herzegovina		
Outcome	Strengthened national capacities in evaluation of improved sweet cherry varieties and good management practices		
	Indicator	Increase in new improved cherry varieties recommended.	
	Baseline	0	
	End Target	At least six.	
	Comments and follow-up action to be taken	Comprehensive data on growth rates, fruit yield, pest resistance and overall performance of different sweet cherry varieties were collected and analysed, providing insights into the strengths and weaknesses of each variety. Nine new sweet cherry varieties were identified for testing, focusing on traits such as higher yield, disease resistance and improved fruit quality. Field trials across different regions to assess adaptability, early performance, productivity and quality of these varieties under various environmental conditions were conducted and included in an assessment of the sweet cherry value chain in the country. Results from the field trials were validated through statistical analyses and feedback from growers, ensuring that selected varieties offer consistent advantages in both yield and management. It was agreed with University of East Sarajevo and University of Mostar that field trials be continued for three more years, after which an assessment paper with recommendations for new improved cherry varieties will be prepared.	
Output 1	Institutional capacity and stakeholder coordination for effective project management developed		
	Indicators	Target	Achieved
	Number of national experts trained under the project.	Up to 15 national experts.	Yes
Baseline	0		
Comments	Significant progress was made in enhancing institutional capacity and fostering stronger coordination among key stakeholders, including ministries of agriculture, extension services and farmers. The project organized four workshops on fruit growing and orchard management with the participation of 63 stakeholders, which served as a platform for dialogue, knowledge exchange and collaboration between academia and the farmer community, producing a more streamlined approach to project implementation, with increased accountability and a stronger foundation for effective and impactful future initiatives of the private sector and government. A total of 24 national experts received training in better cherry orchard management.		
Activity 1.1	Conduct Project Inception Workshop		
	Achieved	Yes	
	Comments	The project successfully conducted an inception workshop in Mostar on 3 March 2023 to introduce the project and plans for field testing of new cherry varieties. The workshop brought together a diverse group of stakeholders, including representatives from relevant government institutions, universities, farmers, NGOs and agricultural cooperatives. The event provided an opportunity to share expertise, address potential challenges and ensure alignment among stakeholders. The event was broadcast on cantonal media and the primetime news of federal television.	
Activity 1.2	Review of the sweet cherry value chain		
	Achieved	Yes	
	Comments	A comprehensive review of the sweet cherry value chain was completed, providing valuable insights into production, processing, marketing and export opportunities. The analysis identified key challenges and opportunities, offering recommendations to enhance competitiveness and sustainability. It serves as a crucial resource for stakeholders, supporting evidence-based decision-making and strategic planning for the development of the sweet cherry sector.	

Activity 1.3	Organize a study tour to Italy		
	Achieved	Yes	
	Comments	A team of three national experts visited various institutions, experimental fields for sweet cherry production and nursery of sweet cherry seedlings in Bologna, Ferrara and Ravenna in Italy, in July 2023. Training from Italian experts was incorporated into the project’s training curriculum. The study tour included visits to sweet cherry orchards to learn about new growing technologies of sweet cherry, training systems, rootstock and protection from biotic and abiotic factors. The team also visited cherry seedling nurseries and laboratories for the production of sweet cherry rootstock, greenhouses for the growth and development of rootstock, orchards of mother plants from which buds are taken for rootstock grafting, nurseries with the grafted seedlings and laboratories where the quantitative and qualitative testing of fruits is carried out. At the Alma Mater Research Institute on Global Challenges and Climate Change (Alma Climate) and Experimental Farm at the University of Bologna, the team learned about good practices aimed at reducing the impact of climate change on sweet cherry production. The knowledge acquired was shared with cherry producers and the research community in Bosnia and Herzegovina.	
Activity 1.4	Project final workshop		
	Achieved	Yes	
	Comments	The project concluded with a final workshop in Neum on 14 November 2024, where key achievements were showcased to relevant stakeholders from government institutions, academia, NGOs, farmers and agricultural cooperatives. The event highlighted the successful field-level testing of sweet cherry varieties, the development of a comprehensive technical manual for sweet cherry production and the sweet cherry value chain assessment. The workshop underscored the project’s contribution to advancing sweet cherry production and fostering collaboration among key actors for the sector’s sustainable growth.	
Output 2	Field testing and validating new improved cherry varieties and management practices of traditional varieties supported		
	Indicators	Target	Achieved
	Assessment report for pilot demonstrations completed.	1	Yes
Baseline	0		
Comments	The regular monitoring and collection of phenological, morphometric and pomological data provided a comprehensive understanding of the performance of different sweet cherry varieties. A comparative analysis highlighted key differences in growth patterns, fruit quality and adaptability to specific environmental conditions. This information is invaluable for selecting the most suitable varieties for commercial cultivation and providing growers with actionable insights to improve their orchard management practices.		
Activity 2.1	Identification and design of pilot demonstration sites		
	Achieved	Yes	
	Comments	Three demonstration sites (located at Mostar, Stolac and Trebinje) were selected, based on their geographical relevance to the target region, accessibility for growers and varying environmental conditions. This ensured a comprehensive demonstration of sweet cherry variety performance under different growing conditions. Each pilot plot was 0.1 ha. The national team prepared the design of the pilot sites.	
Activity 2.2	Procurement of agriculture supplies and inputs for pilot demonstrations		
	Achieved	Yes	
	Comments	FAO procured ten (nine new and one already introduced) varieties of high-quality sweet cherry seedlings from Italy, along with supporting pillars and advanced irrigation equipment, designated for planting and installation on pilot demonstration sites, and aiming to showcase best practices in orchard management and modern cultivation techniques. The initiative was expected to serve as a model for local farmers, promoting the adoption of innovative technologies and improving productivity in sweet cherry production.	
Activity 2.3	Establishment of pilot demonstration sites for validation of improved varieties and production technologies		
	Achieved	Yes	
	Comments	FAO signed a Letter of Agreement with the agriculture cooperative “Plantprom” in Mostar to establish and manage pilot sites during the project, under the guidance of the national team. Key activities included land preparation at each site, soil sampling and laboratory analysis, the design and establishment of customized irrigation systems for maximizing water efficiency, and the planting of 1 050 certified disease-free saplings of selected sweet cherry varieties.	

Activity 2.4	Training of trainers for national personnel on practices of innovative planting materials and berry production technologies	
	Achieved	Yes
	Comments	The project successfully completed a Training of Trainers programme, equipping 24 national specialists with advanced knowledge and practical skills in innovative planting materials and modern sweet cherry production technologies. The training focused on best practices in cultivation, management and technology adoption. This is expected to significantly enhance capacity in the sector, fostering improved productivity and sustainability across the country.
Activity 2.5	Management of pilot demonstration plots, data collection and analysis	
	Achieved	Yes
	Comments	Management throughout the growing season was conducted, including irrigation and water management, nutrient management, pest and disease control, monitoring and data collection (growth rates, leaf colour, fruit set, and tree health), the monitoring of phenological traits and morphometric traits describing the physical dimensions of the plant and its organs, pomological traits measurement and phenological data analysis. To ensure consistency and reliability in data collection, a systematic monitoring protocol was established.
Activity 2.6	Provision of technical advisory support	
	Achieved	Yes
	Comments	Comprehensive technical advisory support was provided to stakeholders involved in project activities. This support included guidance on best practices, problem-solving and tailored recommendations. The advisory services played a crucial role in ensuring the successful implementation of field-level initiatives, enhancing stakeholder capacities and promoting the adoption of innovative approaches in agriculture.
Activity 2.7	Preparation of the assessment paper	
	Achieved	Yes
	Comments	An assessment paper with the results of field testing for sweet cherry varieties was prepared. The paper analyses the performance of different cherry varieties under local conditions, focusing on factors such as yield, disease resistance and overall quality. It serves as a key resource for stakeholders, informing future decisions and strategies in sweet cherry production.
Activity 2.8	Development of technical manual	
	Achieved	Yes
	Comments	The technical manual was designed as a detailed reference guide for growers and technical staff involved in cherry production. It focuses on integrating modern technologies and innovative practices that enhance productivity, quality and sustainability, and contains the following key sections: Introduction to Sweet Cherry Varieties; Soil and Site Preparation; Planting Techniques. Irrigation Systems and Water Management; Orchard Management Practices; Harvesting and Post-Harvest Management; and Innovative Technologies. The manual underwent a thorough review process. Agricultural experts, researchers and experienced cherry growers were consulted to validate its technical accuracy. Their feedback helped to refine the sections on soil management, irrigation technologies and pest control strategies. Results and insights from ongoing field trials of sweet cherry varieties were integrated into the manual, providing real-world data to support the recommended practices. The manual was designed to be visually appealing and easy to use. A comprehensive dissemination strategy was implemented to ensure the materials reached the intended audience. During hands-on workshops and field demonstrations at the demonstration sites, extension materials such as PowerPoint and seasonal calendars were distributed to participants. The events provided an opportunity to explain the materials in detail and answer questions from growers. Copies of the technical manual and extension materials were provided to local agricultural extension officers, who serve as key points of contact for growers. These officers used the materials during farm visits and training sessions. Collaboration with grower associations helped to distribute the materials through their networks, reaching a large number of cherry producers. The development and dissemination of the technical manual and extension materials resulted in an increased awareness and adoption of modern sweet cherry production practices. Feedback from workshops indicated that growers found the materials to be practical, well-organized and highly applicable to their daily operations. The educational content enhanced the technical capacity of growers, extension officers and other stakeholders. Many reported improved skills in areas such as irrigation management, pruning and disease control.

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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