



FOR OFFICIAL USE ONLY

Report No: PAD4302

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF EUR 61.4 MILLION
(USD 68.5 MILLION EQUIVALENT)

TO

BOSNIA AND HERZEGOVINA

FOR AN

AGRICULTURE RESILIENCE AND COMPETITIVENESS PROJECT

March 17, 2022

Agriculture And Food Global Practice
Europe And Central Asia Region

This document is being made publicly available prior to Board consideration. This does not imply a presumed outcome. This document may be updated following Board consideration and the updated document will be made publicly available in accordance with the Bank's policy on Access to Information.

CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2022)

Currency Unit = EUR

BAM 1 = EUR 0.51129

USD1 = EUR 0.89613765

FISCAL YEAR

January 1 - December 31

Regional Vice President: Anna M. Bjerde

Country Director: Linda Van Gelder

Regional Director: Christoph Pusch (Acting)

Practice Manager: Frauke Jungbluth

Task Team Leader(s): Silvia Mauri, Dilshod Khidirov

ABBREVIATIONS AND ACRONYMS

APCU	Agriculture Project Coordination Unit
APHP	Administration of Bosnia and Herzegovina for Plant Health Protection
ARCP	Agriculture Resilience and Competitiveness Project
BAM	Bosnia and Herzegovina Convertible Mark
BiH	Bosnia and Herzegovina
CAP	Common Agricultural Policy
CARPO	RS Agrometeorological Web Reporting and Prognostic System
CBA	Cost-Benefit Analysis
CEFTA	Central European Free Trade Agreement
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
CQS	Consultants' Qualification Selection
CSA	Climate-Smart Agriculture
DA	Designated Account
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESS	Environmental and Social Standards
ERR	Economic Rate of Return
FADN	Farm Accountancy Data Network
FBiH	Federation of Bosnia and Herzegovina
FCR	Farm and Client Register
FSA	Food Safety Agency
FRR	Financial Rate of Return
GBV	Gender-based Violence
GIS	Geographic Information System
GRM	Grievance Redress Mechanism
ICPDR	International Commission for the Protection of the Danube River
IDP	Irrigation Development Project
IFC	International Finance Corporation
IFR	Interim Financial Report
IPM	Integrated Pest Management
LMP	Labor Management Procedures
LPIS	Land Parcel Identification System
MFD	Maximizing Finance for Development
MoAFWM	Ministry of Agriculture, Forestry and Water Management (RS)
MoAWMF	Ministry of Agriculture, Water Management and Forestry (FBiH)
MoFTER	Ministry of Foreign Trade and Economic Relations

NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
OHS	Occupational Health and Safety
PIU	Project Implementation Unit
POM	Project Operational Manual
RPF	Resettlement Policy Framework
RS	Republika Srpska
SEP	Stakeholder Engagement Plan
SOE	Statement of Expenditure
SPC	Shadow Price of Carbon
SPRD	Strategic Plan for Rural Development
TWG	Technical Working Group
UPOV	International Union for the Protection of New Varieties of Plants
VOBiH	Veterinary Office of Bosnia and Herzegovina
WUA	Water Users' Association



TABLE OF CONTENTS

DATASHEET	1
I. STRATEGIC CONTEXT	6
A. Country Context.....	6
B. Sectoral and Institutional Context	7
C. Relevance to Higher Level Objectives.....	11
II. PROJECT DESCRIPTION.....	13
A. Project Development Objective	13
B. Project Components	13
C. Project Beneficiaries	23
D. Results Chain	24
E. Rationale for Bank Involvement and Role of Partners	25
F. Lessons Learned and Reflected in the Project Design	25
III. IMPLEMENTATION ARRANGEMENTS	27
A. Institutional and Implementation Arrangements	27
B. Results Monitoring and Evaluation Arrangements.....	28
C. Sustainability.....	28
IV. PROJECT APPRAISAL SUMMARY	29
A. Technical, Economic and Financial Analysis	29
B. Fiduciary.....	33
C. Legal Operational Policies.....	34
D. Environmental and Social.....	34
V. GRIEVANCE REDRESS SERVICES	37
VI. KEY RISKS	37
VII. RESULTS FRAMEWORK AND MONITORING	39
ANNEX 1: Implementation Arrangements and Support Plan	53
ANNEX 2: Detailed Project Description	67
ANNEX 3: Project Costs	98
ANNEX 4: Economic and Financial Analysis.....	99
ANNEX 5: Greenhouse Gas Emission Assessment	112
ANNEX 6: Map	114

DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Bosnia and Herzegovina	Agriculture Resilience and Competitiveness Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P171266	Investment Project Financing	Substantial

Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
07-Apr-2022	31-Dec-2027

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The Project Development Objective is to increase climate resilience and competitiveness of the agriculture sector.

Components

Component Name	Cost (US\$, millions)
----------------	-----------------------



Enhancing Public Support Resilience and Traceability	9.42
Improving Agriculture Productivity, Adaptation to Climate Change, and Enhancing Linkages with Markets	45.12
Enhancing Food Quality and Safety	10.94
Project Management	3.02

Organizations

Borrower:	Bosnia and Herzegovina
Implementing Agency:	Ministry of Agriculture, Water Management and Forestry of FBiH Ministry of Foreign Trade and Economic Relations of BiH Ministry of Agriculture, Forestry and Water Management of RS

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	68.50
Total Financing	68.50
of which IBRD/IDA	68.50
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	68.50
--	-------

Expected Disbursements (in US\$, Millions)

WB Fiscal Year	2023	2024	2025	2026	2027	2028
Annual	5.00	6.00	10.00	14.00	16.00	17.50
Cumulative	5.00	11.00	21.00	35.00	51.00	68.50

INSTITUTIONAL DATA



Practice Area (Lead)

Agriculture and Food

Contributing Practice Areas

Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category

Rating

1. Political and Governance	● Moderate
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Moderate
7. Environment and Social	● Substantial
8. Stakeholders	● Moderate
9. Other	● Moderate
10. Overall	● Moderate

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No

**Environmental and Social Standards Relevance Given its Context at the Time of Appraisal**

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Currently Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants**Sections and Description**

The Project Implementing Entity shall revise not later than one (1) month after Effective Date and thereafter implement Part B of the Project in accordance with the Project Operational Manual setting forth the operational and administrative responsibilities, Project implementation procedures and rules, including relevant provisions of the RS Rule Book on Irrigation for activities under Part B.2 (b) of the Project, as the same may be amended and supplemented from time to time with the Bank's prior written approval. [Project Agreements Schedule Section I. B. 1. (a)]

Sections and Description

The Project Implementing Entity shall, no later than thirty (30) days after Effective Date, prepare, adopt, and thereafter maintain throughout the Project implementation, a grievance redress mechanism as described in the Stakeholder Engagement Plan. [Project Agreements Schedule Section I. E. 7.]



Conditions		
Type Effectiveness	Financing source IBRD/IDA	Description The Subsidiary Agreement between the Borrower and the Project Implementing Entity referred to in Section 9.01 of the General Conditions has been executed by its parties.
Type Effectiveness	Financing source IBRD/IDA	Description The Project Agreement for the Project Implementing Entity referred to in Section 9.01 of the General Conditions has been executed by its parties.
Type Disbursement	Financing source IBRD/IDA	Description Under Categories (1), (2) and (3) unless: (i) the FBiH Project Agreement has been executed by its parties; and (ii) the FBiH Subsidiary Agreement has been executed by its parties.
Type Disbursement	Financing source IBRD/IDA	Description Under Categories (4), (5) and (6) unless: (i) the RS Project Agreement has been executed by its parties; and (ii) the RS Subsidiary Agreement has been executed by its parties.
Type Disbursement	Financing source IBRD/IDA	Description Under Category (3) unless the Matching Grants Manual has been approved by the FBiH in a manner satisfactory to the Bank.
Type Disbursement	Financing source IBRD/IDA	Description Under Category (6) unless the Matching Grants Manual has been approved by the RS in a manner satisfactory to the Bank.



I. STRATEGIC CONTEXT

A. Country Context

- Bosnia and Herzegovina (BiH) is a country of about 3.5 million people in the Western Balkans.** The Dayton Peace Agreement of 1995 established BiH as a state, ending the 3.5 year long Bosnian War. BiH comprises of two entities: the Federation of Bosnia and Herzegovina (FBiH) and the Republika Srpska (RS). The District of Brčko was added as self-governing administrative unit in 2000. The FBiH is subdivided into 10 cantons, each with its own executive, legislative, and judicial branches of government. The cantons are further subdivided into municipalities. The RS is subdivided into 64 municipalities. Each entity has a high degree of autonomy. The authorities in BiH are, however, pursuing a joint development strategy that centers on macroeconomic stability and export-led growth, employment and social cohesion, and sustainable development. The strategy's overarching goal is the accession to the European Union (EU) with BiH already being a potential candidate for EU membership.
- BiH has a very large public sector relative to the size of its economy - a result of a complex administration of the post-war governance structures.** BiH monetary policy is anchored in a currency board linked to the Euro, which supports local currency stability. The financial sector is resilient owing to, among others, high foreign ownership, improving asset quality, and recent improvements to the regulatory framework. The non-bank financial institution segment remains underdeveloped and has potential to expand and diversify sources of finance in BiH. Credit growth has been positive and accelerating in 2021, with lending to public sector growing faster than lending to the private sector.
- Macroeconomic stability was maintained over the last decade.** This was largely facilitated by the currency board and EU membership prospects, both remaining the main economic anchor for BiH. Despite real Gross Domestic Product (GDP) growth averaged 3.2 percent per annum from 2015 to 2019,¹ per capita GDP continues to hover around one-third of the EU27 average.² This income gap is significantly larger compared to most of other peers in the Western Balkans. With continued low investment rates and an economy driven by private consumption, achieving a more pronounced convergence toward the EU27 average will be challenging. In addition, the pandemic has inflicted a significant cost on BiH's economy in terms of loss of lives, welfare, and economic opportunities.
- While a full recovery to the 2019 real income level was achieved in 2021, BiH is unlikely to match its growth trajectory prior to the COVID-19 pandemic, unless political bottlenecks are resolved.** The rebound in economic growth estimated at 6.5 percent in 2021³ was largely driven by the low base from the previous year caused by the pandemic. Nonetheless, this is an exceptional growth performance, which helped real GDP exceed the pre-crises level. Real growth was driven by a surge in exports, and robust growth in private consumption. In tandem with growth, inflation accelerated to 5.3 percent in the last quarter of 2021 (year over year) and totaled 2 percent for the year compared to a 1.1 percent deflation in 2020. The sharply rising prices were caused by stronger consumer demand, continuing supply chain problems, and a high passthrough effect given the currency board arrangement. The surge in tax revenues was not fully offset by higher spending, which resulted in a return to fiscal surpluses estimated at 0.5 percent of GDP in 2021⁴, after a deficit of 1.8 percent of GDP in 2020. These developments come against the background of rebuilt fiscal buffers before the pandemic. Fiscal surpluses ranged between 2 and 3 percent of GDP over the past six years prior to the pandemic, which in turn helped rein in the current account deficits averaging below 4 percent since 2015. The sharp rise in exports

¹ <https://bhas.gov.ba/>

² <https://ec.europa.eu/eurostat/databrowser/view/tec00114/default/table?lang=en>

³ The WB projection is based on outcomes during the first three quarters combined with higher frequency indicators.

⁴ BiH draft Global Fiscal Framework for 2022-2024 and WB staff estimates.



narrowed the traditionally large, structural merchandise deficit, and helped narrow the current account deficit to 3.2 percent of GDP in 2021 compared to 3.9 percent the year before.

5. **Structural rigidities, including in the public sector in BiH are holding back economic growth and prosperity.** The public sector crowds out the private sector and suppresses its development. Meanwhile, little progress has been made in competitiveness-enhancing product market reforms and improving the business environment.⁵ The public sector, including large state-owned enterprises (SOEs), dominates the labor market hampering private sector-led job creation. The latter is further constrained by high labor taxes. The low employment level impacts poverty reduction and stretches the capacity of the social benefit system.

6. **The overall unemployment rate showed a declining trend since 2015 but remains a major concern.** Unemployment decreased from 27.7 percent in 2015 to 15.7 percent in 2019 owing to an increase in employment from 31.9 to 35.5 percent⁶ but also because of an aging population gradually exiting the workforce. Unemployment among youth is very high at 39 percent, one of the highest rates in the Western Balkans. Youth unemployment is associated with limited economic opportunities and skill mismatches in the labor market. As a result, BiH exhibits the highest stock of emigration across the Western Balkans.

7. **As a potential candidate for EU membership, BiH is working towards an EU future.** BiH has taken important steps towards this aspiration, but progress is required in several areas to reach compliance with EU standards. Agriculture is one of the most important economic activities in BiH, and also one of the most complex, sensitive, and critical sectors in the EU accession context. BiH and the EU gradually liberalized their mutual trade in agricultural products following the entry into force of the Interim Agreement in 2008, and of the Stabilization and Association Agreement (SAA) in 2015, including its adaptation in 2017 to take into account the accession of Croatia to the EU. In its opinion issued in May 2019, the European Commission (EC) argued that BiH is at an early stage of preparation in the area of agriculture and rural development, and requires further levels of preparation in the areas of food safety, veterinary and phytosanitary policy. Thus, substantial work remains to be done to significantly improve the administrative capacity in BiH and establish the fundamental instruments and institutions for participating in the Common Agricultural Policy (CAP), and further harmonizing official veterinary and phytosanitary control systems with EU rules.

8. **Maintaining a reform path is necessary to address structural challenges.** An acceleration in the reforms is key to continue on the road to EU accession, address long-standing structural and institutional weaknesses and enhance competitiveness. Promoting the private sector and reducing the footprint of SOEs would go a long way in establishing a functioning market economy. Overall, the growth model would need to shift from being consumption-driven to one that recognizes the potential of international integration through investments and exports. To achieve this, BiH and its entities need a business environment that allows companies to grow and expand output, employment, and exports.

B. Sectoral and Institutional Context

9. **Agriculture is important to the BiH economy through its contributions to employment, food production and GDP.** More than half of the total population of BiH lives in rural areas (2018) and employment in the primary agricultural sector accounts for nearly 20 percent of total employment. Part-time employment in the agricultural sector stands at around 20 percent of all agricultural employment. In both entities, the largest share of people working in the agricultural sector is people aged between 45 and 54 years, indicating an aging labor force in the sector. The contribution of primary

⁵ https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_5277

⁶ 2017, 2019 Labor Force Survey



agriculture to GDP is around 6 percent (2017) and has been declining over time in line with BiH's gradual structural transformation. The sector's contribution to GDP and employment are higher when looking at the entire agri-food system, including processing and services. The agri-food sector is the most important manufacturing industry in BiH, leading in terms of turnover (23 percent of total manufacturing turnover) and employment, as well as in its geographic footprint in rural areas. In the context of the COVID-19 pandemic, agriculture's importance as provider of livelihood support and social safety nets has proven to be critical.

10. The comparative advantage of the agriculture sector in BiH lies in its closeness to the EU common market.

Agricultural products represent approximately nine percent of total exports. In 2018, agri-food imports totaled USD1.89 billion and exports were valued at USD533 million. Fruit and vegetables, some cereals and some industrial crops, and beverages account for the majority of the agricultural exports of BiH. In particular, BiH is a competitive producer of ware potato, pepper, cucumber and cabbage. It is also among the most competitive producers of raspberries, plums, and competitive for apples, cherries, peaches, and strawberries among the EU, the Commonwealth of Independent States (CIS), and the Central European Free Trade Agreement (CEFTA) countries. Although there is limited data for each specific agricultural product, the trade data from the RS yearbook 2020 identifies dairy products and eggs, and fruit and vegetable as the top two trade categories in the agriculture sector. The export value of dairy products and eggs (BAM 53 million) was about 50% more than the import value (BAM 35 million) in 2019, and the export and import value of fruit and vegetable were almost even (BAM 76 vs. 78 million). BiH has made good progress in meeting EU requirements to access the EU common market and can export potatoes to the EU since 2014 and poultry meat since 2019. The CEFTA agreement, which was signed on December 2006, includes Albania, BiH, Kosovo, Moldova, Montenegro, North Macedonia, and Serbia. BiH is well positioned in terms of market openness, access to inputs, and overall market potential.

11. Despite its importance and comparative advantages, the agriculture sector is operating below its potential.

BiH's agriculture sector is characterized by land fragmentation, low productivity, and low competitiveness for products other than the ones highlighted above. The sector development is impeded by the large number of agricultural holdings and highly fragmented small farming plots. Over 50 percent of all farms operate on less than 2 hectares. Land consolidation to create larger, more productive farm units is limited. On productivity, the value of agricultural output per hectare is the lowest of the Western Balkan countries. The value added per agricultural workers is the second lowest in the Western Balkan region despite some modest improvements. Furthermore, weak compliance and underdeveloped mechanisms and services related to ensuring food safety and adhering to sanitary and phytosanitary standards also limit the competitiveness of BiH's agri-food products.

12. The development of the agricultural sector in BiH is increasingly affected by the consequences of climate change and will require a green transition to be more resilient.

The sector needs to be better prepared – in terms of policy, institutions, and infrastructure – to deal with multiple production and market risks. Climate change effects, especially higher average temperatures, are expected to impact BiH agriculture significantly.⁷ Monthly maximum temperatures are expected to increase and exceed the historical mean by 2.4°C, the number of hot days will increase by 6.3 days, and the annual precipitation will be 4.2 mm less by 2050 under a RCP8.5 scenario. Predicted rises in temperature coupled with changes in rainfall and evaporation, are likely to negatively impact the country's farming zones in the Mediterranean areas and in the Northern regions by increasing the duration of dry periods, the frequency of floods, and soil erosion. Frequent hail and extreme weather events are expected to pose increased threats. Crop cultivation and livestock production also present important opportunities to lower greenhouse gas emissions. According to BiH's recent updated Nationally Determined Contribution (NDC) for 2020-2030, prepared in accordance with the Paris Agreement, the share of GHG emissions of the agriculture sector reduced from 14% in 1990 to 9% in 2014. The NDC calls for emission reductions

⁷ <https://www.climatelinks.org/sites/default/files/asset/document/2016%20CRM%20Fact%20Sheet%20-%20Bosnia%20%28003%29.pdf>;
<https://thinkhazard.org/en/report/34-bosnia-and-herzegovina>



in the country of over one-third by 2030 and of almost two-thirds by 2050 compared to emission levels in 1990. However, the NDC does not set specific targets for each sector, and further GHG emission reduction is expected mainly through clean and efficient energy. BiH is in the process of preparing a National Adaptation Plan (NAP) to Climate Change for medium-term planning of investments in climate sensitive sectors, which will include specific measures for the agricultural sector. Among the proposed measures for the agriculture sector are: (i) introduction of climate change tolerant varieties; (ii) introduction of climate smart technologies; (iii) development of climate data collection software; (iv) development of irrigation systems. These measures are fully addressed under the proposed project. The integrated climate-smart agriculture (CSA) approach which will be adopted in the project addresses the interlinked challenges of climate change adaptation and mitigation, and supports BiH on the NDC, the NAP, and its path for a green transition.

13. BiH agriculture and rural development need to be aligned with EU best practices. As an EU potential candidate country, BiH and its entities, cantons and municipalities have developed a framework for alignment of agriculture and rural development with EU best practices. One of the requirements for the implementation of the EU pre-accession funds and of the EU CAP is the establishment of a system serving as the basis for programming and monitoring agricultural and rural policies. This includes organizational structures and an information system, the latter comprised of agricultural holdings register, animals register, farm accountancy data network (FADN), payment systems and land parcel identification system (LPIS) etc. While BiH has made some progress in this regard, the project will provide support to further enhance the capacity of the institutions to ensure transparency and traceability of agricultural payments, and more efficient use of public funds.

14. BiH has also endorsed the Green Agenda for the Western Balkans which acknowledges the EU Green Deal as the new growth strategy towards a modern, climate neutral, resource-efficient, and competitive economy. This requires, among others, the commitment towards (a) aligning the agri-food and primary production sector with EU standards on food safety, plant and animal health and welfare and environment, and addressing effluent, manure and waste management; (b) strengthening the official sanitary controls along the entire food chain and improving the traceability and labelling of food products to ensure food safety, improve consumer information and promote sustainable food; (c) promoting environmentally friendly and organic farming and reducing synthetic chemical products used in food production (e.g. pesticides, veterinary medicines and fertilizers); (d) cooperating with scientific, education, business and agricultural holdings to facilitate transfer to innovative and environmentally friendly technologies and farming methods; and (e) supporting investments in renewable energy production and technologies as well as emissions reductions and adaptation to climate change measures in agriculture. In this regard, the project will support the application of official risk-based control activities (e.g. inspections, checks, reporting, testing, registrations, certifications) and provision of the required production and processing inputs (e.g. new varieties, certified seed, fertilizers, advice on agronomic practices and water use, etc.) which will facilitate access to markets while mitigating potential negative environmental impact, ensuring sustainability of BiH's rural economy and improved land conservation.

15. Irrigation is one essential element to securing crop production and improving productivity in the face of climate vulnerability. Although BiH is a water rich country, the seasonality of water flows and limited irrigation penetration constrain agricultural production. Only 2.8 percent of total abstracted water is used for agriculture. Higher crop yields, high-value production, and the potential for double-cropping remain elusive without supplemental irrigation, primarily due to the prolonged dry spells during the summer season. Typical yield losses due to water shortages are estimated to be in the range of 30 to 40 percent in the southwestern and 20 to 30 percent in the northern areas in the Sava river plain. Excess water also poses problems through water logging and inundation of plains and valleys, requiring more investment in adequate drainage systems. The recently completed Bank-financed Irrigation Development Project (IDP) demonstrated the transformative impacts of delivering reliable irrigation services in BiH. The systems built through the project were designed to provide irrigation services on-demand, which is suited to the farming systems of BiH characterized by a large



number of privately-owned very small plots. The provision of on-demand irrigation services enabled the real-time supply of sufficient water quantities to the beneficiaries, providing flexibility to the farmer to decide what and when to produce, minimizing the collective action problems inherent to most public irrigation systems, and avoiding the usual head-tail inequity in irrigation water distribution. The project resulted in increased yield and quality of agricultural products (i.e. larger and more compact fruits when sorting in cold storage facilities), and contributed to the expansion/creation of rural businesses and employment generation.⁸ Building on the IDP's approach and experiences, the project will scale-up the irrigation and drainage systems in BiH.

16. Further production aggregation and strengthening of targeted value chain integration and linkages are necessary for improving the competitiveness of agri-food products in BiH. Fruits, vegetables, milk, and meat products are among the most competitive agri-food sub-sectors in BiH. However, land fragmentation undermines the competitiveness of the agricultural sector, which decreases the potential for investment and introduction of modern farming techniques. The agricultural holdings generally have main facilities equipped with basic agricultural machinery that tends to be mostly old and often outdated. Due to seasonality and lack of storing capacities for their products, fruit and vegetable producers are not able to generate greater income. Local production of seed is insufficient and large quantities of seeds are imported. Small producers are poorly organized and production for a prominent buyer is almost non-existent. These weaknesses call for better integrated agri-food value chains. Institutionally, producer organizations and farmer cooperation could assume the role to promote better technologies and more rapid technology adoption, a more efficient aggregation of production, better market access, including country-wide markets to expand the import substitution and to export markets, and achieving higher productivity and economies of scale; however, they remain largely underdeveloped in BiH. The project will provide matching grants to promote efficient aggregation of production and development of the agri-food value chain.

17. Improving resilience and competitiveness also requires better compliance to ensuring food safety and adhering to sanitary and phytosanitary standards. Compliance with export product quality requirements is often achieved by larger producers only. Raising compliance calls for modernizing compliance inspection systems and for strengthening surveillance and control programs applying a 'One Health' approach, as promoted by the World Bank⁹ and relevant sectoral international organizations,^{10,11} that protects animal health, food safety, and public health from diseases and zoonoses and related issues (i.e. antimicrobial resistance). Past such events (e.g. bovine spongiform encephalopathy, 'Bird flu' - H5N1, 'Pig flu' - H1N1, Severe Acute Respiratory Syndrome – SARS, Ebola) have demonstrated potential for causing considerable losses to human and economic losses (both direct and indirect) amounting to several hundreds of billions.¹² Related to 'One Health', one of the key lessons learned from the current COVID-19 pandemic highlighted the importance of ensuring that relevant sectoral and associated multi-disciplinary (e.g. laboratory, data gathering and exchange) networks in BiH are working together through functional synergies, practical exchanges, and efficient and effective utilization of available capability and capacity to support relevant policy and decision making, and implementation. Interoperability requires synchronization, rather than merging, of the existing systems and networks. This also calls for application of modern technology innovations to strengthen data management systems through linkages and management of large amounts of heterogeneous data to ensure relevance, efficiency, effectiveness, and sustainability. Further, as agri-food exports currently largely consist of low-value-added products, there is need to

⁸ See for instance, the case of Bratunac irrigation system developed as part of IDP.

⁹ World Bank. 2013. World Development Report 2014: Risk and Opportunity—Managing Risk for Development. Washington, DC: World Bank. doi: 10.1596/978-0-8213-9903-3. License: Creative Commons Attribution CC BY 3.0

¹⁰ FAO/OIE/WHO (2017). Tripartite's Commitment Providing multi-sectoral, collaborative leadership in addressing health challenges

¹¹ FAO/OIE/WHO (2018). Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries

¹² World Bank Group (2018). One Health – Operational framework for strengthening human, animal, and environmental public health systems at their interface. Washington, DC



promote the introduction and adoption of improved production technologies and management processes, to facilitate increased value-addition and value chain linkages, and to develop the enabling infrastructure and access to markets.

18. **The sector can serve as driver for the medium-term post-COVID-19 economic recovery for employment and job creation and for structural sector reform.** Short-term impacts of the crisis included temporary higher food price volatility, including higher prices for fruits and vegetables, and for wheat because of disturbances in international markets; disruptions in domestic value chains and decreased demand for food products from hotels, restaurants, and catering services; market access restrictions due to border closings; and short-term disruptions in local labor markets due to restrictions of movement. However, the agriculture labor market has been largely exempted from these restrictions. BiH also supported small farmers through loans to stimulate investments, input support packages (seeds, fertilizer), and guarantee schemes to protect and ensure the continuation of agriculture production. In addition, some price controls were instated to regulate margin limits for essential groceries. Some support schemes for small and medium enterprises were also set up. In view of the agricultural sector's potential, the crisis offers opportunities to address long-standing structural issues to help the entities to leverage and strengthen the sector's contribution to economic recovery and increased resilience.

C. Relevance to Higher Level Objectives

19. **The proposed project is aligned with the World Bank Group's "Saving Lives, Scaling-up Impact and Getting Back on Track" approach paper of June 2020 in response to the COVID-19 crisis.** Specifically, the project would support two out of four focal areas of the World Bank Group's crisis response support: *(a) economic response for saving livelihoods, preserving jobs, and ensuring more sustainable business growth and job creation; and (b) focused support for strengthening policies, institutions and investments for resilient and sustainable recovery.* In particular, the project will support the development of sustainable agriculture value chains and enhancement of an effective 'One Health' and food safety system.

20. **The project is aligned with the World Bank – BiH Country Partnership Framework (CPF) 2016-2020 for BiH¹³ and the 2020 Systematic Country Diagnostic Update.** The project responds to the CPF objective to *Improve public services efficiency; private sector growth and preventing degradation of natural resources and building resilience to natural shocks.* Although the preparation of the CPF 2021-2025 has been temporarily postponed due to the COVID-19 pandemic, the 2020 Systematic Country Diagnostic Update which underpins the forthcoming CPF has identified as one of the country priorities "better leveraging of natural resources for growth" given the significant contribution to growth and jobs in the agriculture and forestry sectors. Unlocking the potential of these sectors will require fostering adoption of new technologies in production and management processes, and improving access to markets, among others.

21. **The project would contribute to BiH's Strategic Plan for Rural Development (SPRD) for 2018-2021.** The project would directly contribute to four of the six main SPRD strategic goals for development of agriculture and rural areas, namely: *(a) strengthening competitiveness of agriculture, forestry and rural areas through increasing the level of investments and improving the transfer of knowledge and promotion of innovation; (b) improving marketability of agri-food products by increasing value-added activities, improving quality and safety standards and strengthening linkages within the value chains; (c) sustainable management of natural resources and climate change adaptation; and (d) improving institutional systems and capacities and harmonization of the legal framework in agriculture and rural development with the aim of gradual approximation to the EU CAP.* The alignment with EU requirements also requires

¹³ Report No. 99616-BA, discussed by the Board on December 15, 2015



improving the efficiency of the budgetary resources for agriculture and providing access to key information and the data for evidence-based policy programming, which would be supported by the project. Further the project will take into consideration the National Adaptation Plan that will build upon the 2013 BiH Climate Change Adaptation and Low Carbon Development Strategy currently being developed with support of UNDP and expected to be published in 2021.

22. The project would contribute to the FBiH Development Strategy for 2021-2027. The project is aligned with the strategic goals, priorities and measures included in the FBiH Development Strategy. One of the strategic goals in the agri-food sector is to promote resource efficient and sustainable development and priorities include (a) support to technology transfers and development; (b) reduce inactivity and unemployment by increasing access of vulnerable groups to the labor market of the agricultural sector; (c) ensure the sustainable use of water resources; (d) support the development of rural areas by establishing functional capacities for agriculture and rural development, and enhancing the quality and competitiveness of agri-food production and resilience of agricultural producers.

23. The project will contribute to the World Bank twin goals to end extreme poverty and boost shared prosperity. The project will contribute to poverty reduction by assisting producers, many of whom are small and comprise the poorest, to increase their farm productivity and incomes, and promoting better rural jobs through improving access to technologies, knowledge, and markets, strengthening technical and managerial capacity in the farming and agri-business sectors. The project will promote shared prosperity by supporting the growth and development of aggregators and collection centers in the rural areas, creating more and better paying jobs in the agro-processing, trading and export sectors, and increasing the value added to the agricultural sector. Additionally, the project fully integrates climate considerations and will adopt an integrated climate smart agriculture approach to improve agricultural productivity, increasing resilience to climate change and reducing emissions, thus it will contribute to the implementation of the Bank's forthcoming Climate Change Action Plan. Finally, the project is aligned to the Bank commitment to support a Green, Resilient and Inclusive Development (GRID), by simultaneously aiming at addressing the impact of climate change, building resilience to various shocks of the public sector and increasing the capacity of small holder farmers and their market integration.

24. Project preparation and implementation involves active collaboration with the International Finance Corporation (IFC), which also views the agribusiness sector and inclusive value chain development as a priority. While the collaboration is based on the comparative advantages of the Bank and IFC, given the small size of the markets and of the investments envisaged under the project, specific activities have not yet been identified. These will be explored during project implementation in case suitable advisory opportunities or investments will be identified beyond those envisaged under the matching grant model supported by the project.

25. The project is highly relevant for the Maximizing Finance for Development (MFD) agenda. In the context of the BiH's overall objective to promote private sector led agricultural development, the project will play a key role in fostering Private Capital Mobilization as part of the MFD agenda through (a) provision of matching grants which will foster the aggregation of smallholder farmers and their connection with value chain actors, capacitating agribusinesses and promoting future private investments into the value chains; and (b) support the upgrading and modernization of public food quality and safety institutions and systems, including improving traceability, food safety and quality standards which will contribute to removing bottleneck and fostering an enabling environment for commercial agribusiness. The project will also provide key public goods for the agriculture sector to increase its competitiveness through the irrigation investments.

II. PROJECT DESCRIPTION

A. Project Development Objective

26. The **Project Development Objective (PDO)** is to increase climate resilience and competitiveness¹⁴ of the agriculture sector.

27. The PDO will be measured by the following indicators:

Increasing climate resilience of agriculture:

- (i) Farmers adopting improved agricultural technology; (This is a Corporate Results Indicator. In the context of the project, adoption of “improved agricultural technology” will measure the adoption of *climate smart technologies* by farmers participating in the project. The information will be disaggregated by gender.)
- (ii) Farmers with access to irrigation/drainage services supported by the project.

Increasing competitiveness:

- (iii) Percentage of aggregators supported by the project reporting increases in sales.
- (iv) Increase in percentage of improved risk-based official controls by the veterinary, food safety and plant health sectors.

B. Project Components

28. **Component 1: Enhancing Public Support Resilience and Traceability (EUR 8.44 million).** This component aims at improving efficiency, resilience and traceability of the entities’ budgetary resources allocated to the agriculture sector, providing the relevant institutions with access to key information and data for policy programming including climate-smart agriculture (CSA) policy and adaptation/mitigation planning, enhancing the capacity of the agriculture ministries to adjust their support to the sector in response to shocks, while aligning with EU requirements, and strengthening the extension services in agriculture to improve dissemination of knowledge including on use of new technologies and adoption of CSA practices. It includes the following two sub-components:

29. **Sub-Component 1.1 – Enhancing Agriculture Information Systems (EUR 5.46 million).** This sub-component will support (a) enhancing the farm and client register (FCR), including the establishment of new registers for priority value chains and other registers, information systems and web portals; (b) developing a payment system with online application functionality (as shown to be highly relevant to ensure implementation of agriculture support during the pandemic given that currently paper application are in use); (c) strengthening the existing agricultural information system and related geographic information system (GIS) components, including in RS strengthening the existing Agrometeorological Web Reporting and Prognostic System (CARPO), for improved climate information services and support for precision

¹⁴ Increased resilience in the project context refers to resilience to climate change and will be measured by PDO indicators (i) and (ii) and increased competitiveness of agriculture products will be measured by PDO indicators (iii) and (iv).



agriculture; and (d) establishing the Farm Accountancy Data Network (FADN) to improve information collection and data use for policy analysis. Improvement of the agriculture information systems would contribute to increasing both the resilience and traceability of the support provided to the agriculture sector at entities' level. While the development of FCR (a), CARPO (c), and FADN (d) would contribute to future CSA policy planning, the development of a payment system (b) would contribute to the implementation of CSA measures.

30. Sub-Component 1.2 – Supporting Climate-Resilient Agriculture (EUR 2.98 million). This sub-component will support (a) improving seed quality and production, including improvement of local varieties to be better adapted to climate change (e.g. drought-resistant, heat tolerant and flood tolerant) in RS; (b) increasing farmers' awareness of possible climate change impacts to different geographical areas and sub-sectors of agriculture; and (c) improving extension service delivery including through developing related information systems, registers, and web portals, and providing support to producers to comply with Good Agricultural Practices and Integrated Pest Management (IPM) and climate risk assessment and interventions in value chains. Further the extension service will support the introduction of measures for climate adaptation and mitigation including utilization of improved seed varieties that are adapted to climate change, combined with diversification through agroforestry, intercropping or other diversification strategies.

31. Component 2: Improving Agriculture Productivity, Adaptation to Climate Change, and Enhancing Linkages with Markets (EUR 40.43 million). This component aims at supporting private sector driven value chain development, productivity improvements and agricultural technology transfer, improving agricultural water management, including adoption of pressurized irrigation systems, and improving market access. CSA would be applied as a cross-cutting approach where appropriate. It will include the following two sub-components which are expected to reinforce each other for greater and more sustainable impact:

32. Sub-component 2.1 – Strengthening Value Chains and Developing Productive Partnerships (EUR 6.65 million). This sub-component will provide matching grants to leverage private sector investments into green and effective value chain development and productive partnerships between producers and agri-businesses (processors and aggregators) in various agriculture sub-sectors with good economic and resilience/adaptation potential, e.g. fruits and vegetables, dairy, livestock and others. Matching grants will be provided to the aggregators (direct beneficiaries), which are represented by any business entity handling and/or procuring agriculture produce, (i.e. private collection centers, agro-processors, cooperatives, cluster of association of producers), who will directly cooperate and link with producers (indirect beneficiaries) by supporting input supply, marketing horticulture and livestock products in the internal and external markets, and increasing knowledge and capacity of the farmers to comply with market requirements. These arrangements will help realize some economies of scale within smallholder-based production systems, and address land fragmentation and market-matching problems to a greater extent. The objective of the sub-component is to increase farm productivity and incomes and foster greater and better rural jobs through: (a) improving access to and adoption of climate-smart technologies, knowledge, and markets; and (b) strengthening technical and managerial capacity of smallholder farmers in the farming and agri-business sectors. It is expected that the matching grants will bring sustained benefits to the project beneficiaries over the long-term. The sub-component will address a number of market failures, namely: (a) the difficulties of small scale producers to access markets, notably EU export markets, and the deficient links between them and formal agribusinesses/ traders/ exporters/ input suppliers; (b) the difficulties of smallholders and of value chain actors to access investment financing and the inability of existing national finance institutions to provide adapted short to medium term value chain finance products; (c) deficiencies of smallholders access to improved technologies, information, knowledge, and agricultural inputs, etc. The sub-component will contribute to guide widespread adoption of best manufacturing and hygiene practices to mitigate significant quantitative and qualitative losses along the selected value chains. Matching grants provide an incentive for food business operators to implement measures at reducing such losses by improved storage conditions.



33. This sub-component will support: (a) the provision of matching grant to *aggregators*; (b) tailor made technical assistance to the beneficiaries of the grants to comply with market requirements, including improving livestock and horticultural production and productivity; lifting the quality of livestock, fruit and vegetable products, avoiding food loss and waste along the value chain, and building capacity to reach international standards for certification (GLOBALGAP); and (c) awareness activities to promote the matching grant program (e.g. workshop and printing promotional material).

34. A Matching Grants Manual defining the eligibility and selection criteria, detailed implementation procedures, and related fiduciary and safeguards requirements of the grants program has been developed based on the Bank's international experience in matching grants approaches and lessons learned from similar programs implemented in neighboring countries adapted to the BiH-specific requirements and targets. Sub-projects would be selected based on a competitive selection process. Eligibility criteria include in particular attention to smallholder farmers and gender inclusiveness, while selection criteria include, among others, demonstration of resilient and climate smart technologies, promising and market-oriented value chains and value chain linkages, job creation, further emphasis on gender, potential for private sector engagement, and efficient and sustainable production methods.

35. Investments to be co-financed under the matching grants could include: provision of adequate agriculture inputs (appropriate fertilizers for precision agriculture, climate-tolerant seeds), renewable energy/infrastructure, greenhouses, investments in energy-efficient cold-storage rooms for the preservation of produce, vegetable and fruits washing/cleaning equipment and technologies, equipment for drying of fruits and vegetables, refrigerated vehicles for improved transport conditions and reduced food loss and waste along the value chains, or investments in canning facilities at farmer community or aggregator level, investments in selected local markets to reduce food loss and waste, innovative solutions for greener and more sustainable livestock production (e.g. low emission feeds, improved manure management for circular use), among others. The grants will also include provision of technical assistance available for the applicants including for the preparation of business plans, carrying out procurement procedures, etc. as needed.

36. The following infographic shows the contribution of component and sub-component activities along the value chain.



Sub C1.2 <ul style="list-style-type: none"> • Production of seeds adapted to climate conditions • Advisory services, including research targeted towards challenging climate changes • Agricultural knowledge and skills amongst farmers, aimed at increasing productivity and introduce new technologies 	Sub C2.1 <ul style="list-style-type: none"> • Access to climate smart post-harvest storage capacity • Capacity building to comply with market requirements: <ul style="list-style-type: none"> ➢ Improve quality ➢ Develop sustainable agriculture practices • Capacity building for business management • Fair contract farming agreement with aggregator 	Sub C2.1 <ul style="list-style-type: none"> • Contract farming agreements to secure aggregation and supply of quality products • Access to climate smart technologies for processing activities (cooling, sorting/grading, storage – cold cells – sustainable packaging) • Technical assistance for technology use and maintenance • Capacity building on marketing and business management 	Sub C2.1 <ul style="list-style-type: none"> • Support to cold chain development: <ul style="list-style-type: none"> ➢ Access to refrigerated transport ➢ Capacity building to respect cold chain requirements to improve agri-food products shelf life and quality 	Sub C2.1 <ul style="list-style-type: none"> • Access to domestic and international outlets for local production through knowledge sharing of buyers' requirements by aggregators with local producers
Sub C2.1 <ul style="list-style-type: none"> • Provision of fertilizers and seeds by aggregator • Access to climate smart technologies for improved production • Technical assistance for technology use and maintenance 	Sub C2.2 <ul style="list-style-type: none"> • Irrigation systems using climate smart technologies in selected areas 	Sub C3.1 <ul style="list-style-type: none"> • Laboratory testing for food safety (microbiological, chemical, residues, antimicrobial resistance) 	C3 <ul style="list-style-type: none"> • Risk based official controls for live animals, food of animal origin, animal feed, and plants/plants products 	Sub C3.1 <ul style="list-style-type: none"> • Laboratory testing for animal diseases and zoonoses, food safety and plant pests and pathogens for import and export purposes
C3 <ul style="list-style-type: none"> • Laboratory capability for official testing for animal diseases and zoonoses, foodborne pathogens and plant pests and pathogens • Controls for animal health, food safety and plant health • Input into risk-based policy and decision making 	Sub C3.1 <ul style="list-style-type: none"> • Effective and efficient official controls • Laboratory testing for animal diseases and zoonoses, and plant pests and pathogens 	Sub C3.2 <ul style="list-style-type: none"> • Risk based official programs and controls for food safety 		Sub C3.2 <ul style="list-style-type: none"> • Risk based official national controls for animal diseases and zoonoses, food safety and plant pests and pathogens • Risk based border controls for imports • Official certifications for exports in compliance with relevant international standards



37. **Sub-component 2.2 – Improving Irrigation and Drainage Systems for Climate Change Adaptation (EUR 33.78 million).** This sub-component aims to improve the irrigation and drainage systems development and management and strengthen climate-smart agricultural practices as two core elements of the resilience and adaptation agenda in agriculture. Energy-efficient irrigation systems and renewable energy infrastructure will be promoted to mitigate GHG emission. Experiences of the recently completed Bank financed IDP showed it contributed to improving agricultural production and productivity thereby enhancing farmers income, specifically when the irrigation water is utilized for the production of high value agriculture products. In BiH, access to irrigation allows earlier planting and creates possibilities for double cropping, crop diversification, and use of more efficient and water saving irrigation technologies – aspects that are critical for obtaining higher prices due to being able to provide markets earlier, increasing productivity per hectare due to more intense use of the available land area, and controlling water use of the sector. Early fruit and vegetable production made possible in the irrigated areas allowed for earlier market access and demonstrated international comparative advantage. Access to irrigation also allowed to produce fodder maize that has helped to increase productivity of dairy.^{15,16} Further, design of the sub-component activities rely on the Irrigation and Drainage (Eco)system approach which calls for a rethink on how the irrigation and drainage sector are supported to align the sector with current and future demands and circumstances. Irrigation and drainage are inherently part of a complex socio-technical-ecological system influenced and affected by weather and climatic, agroecological, socioeconomic, governance, policy, and human behavioral factors - called irrigation and drainage (eco)systems¹⁷ and referring to the biophysical, policies, institutions, and socio-economic circumstances that impinge upon, interact with, and influence the performance of the sector including the achievement of the associated development goals. These (eco)systems play a powerful role in influencing outcomes from investments in irrigation and drainage infrastructure at multiple scales and dimensions.

38. The sub-component will be implemented in coordination with the commercial value-chain investments under sub-component 2.1. Specifically, it will support: (a) selectively developing new and rehabilitating existing irrigation and drainage systems where they prove to economically and sustainably boost agricultural productivity, support diversification towards higher value crops, improve agricultural export competitiveness, revitalize the rural economy, and increase resilience of production to climate change impacts; and (b) strengthening the institutional and financial arrangements for sustainable operation and maintenance of the irrigation and drainage systems and improved water resources management planning. The specific activities under this subcomponent will include:

- **Rehabilitation/modernization of selected irrigation and drainage systems.** This will support investments in infrastructure construction of intake structures, main and secondary irrigation networks, including introduction of modern pressurized systems which enhance efficiency of water use. Energy-efficient irrigation systems and renewable energy infrastructure/technologies (e.g. solar-powered) will be explored and promoted. The scheme selection criteria have been identified and agreed in consultation with the relevant staffs of the FBiH Ministry of Agriculture, Water Management and Forestry (MoAWMF) and RS Ministry of Agriculture, Forestry and Water Management (MoAFWM) (see Annex 2). The criteria were chosen to ensure that the selected irrigation schemes would contribute to the overall agricultural competitiveness and resilience goals. The specific agreed criteria include implementation readiness of the schemes (i.e., availability feasibility studies, environmental and social due diligence reports, etc.); group or communal ownership to ensure equity in access to irrigation; willingness of farmers, municipalities and cantons to make financial contributions towards the scheme development costs; potential for diversifying towards economically remunerative higher value crops; minimum environmental and

¹⁵ FBiH Development Strategy 2021 to 2027

¹⁶ IDP RS Completion Report

¹⁷ In the present context, the term “(eco)system” has a wider meaning than the literal interpretation of natural ecosystems. An irrigation and drainage (eco)system is a broader term that comprise a combination of hydrological, environmental, social, economic, governance, and human systems that interact upon and influence outcomes of irrigation and drainage sector investments.



social footprints (i.e., avoiding physical displacement of people and encroaching into protected areas or sensitive environments). The municipalities and/or farmers are expected to contribute about 15 percent of the required budget for developing the main and secondary systems.

Implementation readiness is an important criterion given the processes involved in undertaking irrigation and drainage infrastructure development in BiH. There are complex approval, concession, and permit processes (e.g. water approval, water concession, water permit, urban approval, construction permit, electric power approval, electric power permit, etc.) involving numerous local, regional and entity government institutions before concluding an agreement with contractors.

The two entities vary in terms of availability of implementation ready irrigation schemes. FBiH has two sets of potential schemes for implementation. The first group consists of four implementation ready schemes prepared as part of the IDP with combined area of 424 ha. The second group includes 15 schemes (estimated at 2,465 hectares) for which feasibility and design studies are yet to be conducted to make them investment ready. RS has nineteen irrigation schemes with a combined irrigation command area of 3,485 ha, which are at varying stage of implementation readiness. Of these schemes, two schemes with a total command area of 290 ha are ready for implementation and the feasibility and design work of eight small schemes totaling 962 hectares is planned to be covered by municipalities, which are expected to be ready for implementation by project effectiveness. The remainder would require further prioritization and preparatory/design works. In total, the project is expected to develop about 5,500 ha of new or improved irrigation areas, of which detailed designs are expected to be ready for 1,676 ha (about 30.5%) by project effectiveness.

The beneficiaries of the irrigation schemes are expected to benefit from the available support to improve on-farm irrigation systems provided both by the FBiH MoAWMF and RS MoAFWM agriculture support programs and ongoing EU-funded matching grant schemes. The infrastructure investments under this sub-component will be complemented by market opportunity strengthening through matching grants under sub-component 2.1.

Feasibility studies and detailed designs for the construction/rehabilitation of some existing and new irrigation systems have been developed under the IDP. The feasibility studies include economic and environmental assessments on the efficiency of proposed infrastructure investments and expected water usage requirements. However, the environmental and social issues were assessed using the Bank's old safeguard policies and therefore require a reassessment and update to align with the World Bank's Environmental and Social Framework (ESF). This has been done along with the preparation of the entire environmental and social due diligence package.

- **Strengthening of irrigation and drainage management institutions.** The management of the project developed irrigation and drainage schemes, including operation and maintenance (O&M), will be ensured through agreements signed between relevant entities. The process begins with a decision on the legal entity that will manage the irrigation and drainage system, which could be local communal enterprises, Water User Associations (WUAs), cooperatives, etc. The identified legal entity is required to: (i) obtain the right on water use (water permit, and water concession); (ii) prepare the contract on use, maintenance and securing the operation of irrigation and drainage system; (iii) define the compensation for water use from the system through a participatory approach in order to cover all O&M costs; (iv) develop annual plan for the utilization of irrigation and drainage system, which need to be authorized or consented by municipality or cantonal ministry; (v) ensure regular maintenance of all parts of irrigation and drainage system (pumps, pipeline, weed, sludge); (vi) regularly monitor water quality to control hazardous and damaging matters; and (vii) monitor soil fertility and soil pollution



to control the consequence of application of agro-chemicals.

The relevant entities for managing the irrigation and drainage systems will be supported to enhance their capacities. This will include (i) building the capacities of project benefitting municipalities and cantons, and establishing and strengthening participating of WUAs, municipal level public utility companies or joint WUA/public utility companies to participate in the O&M of the systems rehabilitated or constructed under the project, including development of O&M arrangements; determination, collection and management of irrigation service fee; and modernization of on-farm water management practices to reduce water wastage; and (ii) developing a database of all irrigation systems, including GIS mapping of existing irrigation and drainage networks and assessment of their functionalities which helps the municipalities and the ministries to manage irrigation and drainage assets and develop regular maintenance and rehabilitation plans. The key output of the capacity building and institutional strengthening activities is the Irrigation and Drainage Information Management System (IDIMS). The project will only engage in irrigation systems for which cooperation and operations and maintenance arrangements have been agreed.

39. Under this sub-component the labor-intensive civil works arrangements can be considered to support measures responding to the impact of COVID-19 on employment and incomes. Irrigation and drainage works can contribute to generating short-term employment opportunities for both skilled and unskilled labor. They can be traditional labor-intensive approaches, small enterprise intensive construction, inputs-for-assets programs and community contracting. The component will also closely collaborate and assure alignment with the EU-funded farm irrigation support that is currently providing matching grants for on-farm irrigation investments.

40. **Component 3: Enhancing Food Quality and Safety (EUR 9.80 million).** This component will support the upgrading and modernization of public food quality and safety institutions and systems with the aim to: (a) protect local consumers from unsafe and contaminated produce; (b) improve access to higher quality products; (c) support farmers, processors and traders in meeting food safety and quality compliance standards domestically and internationally; (d) monitor and manage food borne diseases risks to human and animal health; and (e) enhance emergency preparedness, response and capacity building to better manage the threat of increased foodborne risks associated with climate change. The component will also contribute to the upgrading and harmonization of current BiH standards with relevant EU legislation related to animal health, food safety, plant health, and development of a traceability system accounting for climate change as a driver of emerging risks for food and feed safety, plant, animal health and nutritional quality. It comprises of the following two sub-components:

41. **Sub-component 3.1 – Food Quality and Safety Standards (EUR 5.86 million).** This sub-component will provide investment and technical assistance support to the relevant food quality and safety institutions in BiH (i.e. competent authority, entity ministries, entity inspectorates, entity research institutes and facilities, analytical laboratories, and joint management and active collaboration between the parties in the system) to strengthen official disease and pests controls, traceability, inspections, risk assessment (including climate-driven contamination risks, climate sensitive risk factors and illnesses) and laboratory capacity and testing in food safety, veterinary and phytosanitary areas. This is primarily related to a competent authority roles and responsibilities for border controls, surveillance and disease prevention and control, laboratory testing, official inspections, and export certifications to protect animal health and welfare and public health (i.e. zoonoses) while facilitating trade in live animals and their products. It will support one of the key components of BiH's Strategic Plan for Rural Development (2018-2021) aimed at promoting the investments in gradual alignment with the relevant EU legislation and international standards and requirements (i.e. WTO/SPS, *Codex Alimentarius*, OIE, IPPC). It will build on BiH's previous successes and achievements in protecting domestic and international consumers' health while facilitating trade (i.e. EU approved exports of honey, fish, poultry, dairy, ware potatoes), rural development and creating employment. It will ensure synergy with the other relevant initiatives (i.e. EU



twinning projects, other donor-funded projects) to avoid duplication and provide adequate and targeted investments in sanitary and phytosanitary areas. The investments in food quality and safety infrastructure (i.e. laboratory building, improvement of existing facilities at scientific units) and capacity (i.e. laboratory equipment and equipment for inspectors and risk-based inspections) will help to ensure that agricultural products are safe for human consumption, traceable, and with minimized risks related to animal diseases that can be transmitted to humans (i.e. zoonotic diseases); production and/or processing related pathogen contamination of food products; and hazardous substances, such as unacceptable contents of residues of plant protection products, heavy metals, toxins, biological contaminants and nitrates. These activities are also expected to boost production (and potential export) of high value products such as fruit and vegetables and potentially red meat.

42. Sub-component 3.2 – Information Technology (IT) Systems for Food Safety Enhancement (EUR 3.94 million). This sub-component will finance the development and upgrading of IT software and hardware systems in veterinary, food safety and plant health areas in FBiH and BiH, that are critical for real-time documentation of control activities and preparedness for increased foodborne risks associated with climate change. These activities therefore are key to improving compliance with national and international food safety standards.

43. Overall, the investment will support a review of the existing IT systems in veterinary areas and propose further upgrades. It will support the establishment, horizontal connectivity, and implementation of reliable and credible IT systems at the State (Veterinary Office, Food Safety Authority, Plant Health Authority), Entities (FBiH, RS) and District Brčko level in compliance with BiH and EU requirements in animal health, food safety and plant health. Furthermore, this will ensure compatibility and inter-operability of the IT systems with EU Animal Disease Notification System (ADNS), EU Trade Control and Expert System (TRACES), EU Rapid Alert System for Food and Feed (RASFF), and EUROPHYT (now all being integrated into EU IMSOC), FAO INFOSAN and e-Phyto, to provide for more efficient data management, and information and documentation exchange on official agri-food chain controls and inspections in relation to risks and hazards (including those associated with climate) to animal health and welfare, public health and plant health. It will support implementation of sector specific policies and official controls supported by risk assessment (including climate-driven risks), risk management and risk communication in compliance with the BiH legislation, EU and international organizations requirements and standards. It will further support the country's readiness to access markets that require increased food safety management measures that are digitally accessible. This can also support more direct producer and consumer marketing linkages as digital agriculture marketing platforms are further elaborated and shorter value chain linkages may become increasingly in demand. It will enable food business operators to assume primary responsibility for food safety by adopting and implementing EU food safety legislation and standards at all stages of production, processing, storing and distribution, transport and placing of food on markets (i.e. from farm to fork). This will also enable food safety specialized companies to offer their services to food business operators to meet standards and requirements in certain aspects. These would be in line with the EU Food Safety law which also clearly specifies the roles of official authorities in food safety (i.e. legal and policy requirements and standards, registration of food businesses, official controls and compliance, enforcement, traceability and incident management of food safety events).

44. Component 4: Project Management (EUR 2.73 million). This component will support a Project Implementation Unit (PIU) in both entities and a Monitoring and Evaluation/Coordination Specialist at the BiH level. The PIUs will provide overall project coordination and implementation support, including implementation planning, technical supervision, fiduciary management (financial management, procurement), environmental and social safeguards implementation and monitoring and evaluation (M&E). The PIUs will also manage the project's grievance redress mechanism (GRM) and citizen engagement activities. The PIUs will build on the implementation arrangements of the previous Bank-funded Agriculture and Rural Development Project (ARDP) and IDP. These PIUs have proven experience in day-to-day project management, administration and coordination, including for procurement, financial management, safeguards, and



monitoring and reporting to the Bank. Additional technical capacity as required for the implementation of the project will also be supported.

45. **Citizen Engagement.** Because of COVID-19 restrictions, the assessment of non-governmental project beneficiaries has been undertaken through a desk review. Based on the lessons learned from previous Bank operations in the sector and in the region, a multiple channel approach is planned under the project to support citizen engagement. This will include: stakeholder consultations; a perception survey at mid-term and at project-end; a project-specific GRM to receive feedback from beneficiaries, project-affected persons, and general public on an ongoing basis on the activities of the project; and outcome indicators measuring the (a) satisfaction of service providers (extension services), and (b) the satisfaction of how effectively the project is addressing the identified market failures. The project's citizen engagement approach will also include a feedback mechanism to generate recommendations on how to strengthen participation based on gender representation of direct beneficiaries and other stakeholders, and how to strengthen implementation throughout the project's lifetime. Based on the lessons learned from ongoing operations during the COVID-19 crises restrictions and given that both PIUs are experienced in implementing GRM and CE activities, the project will explore IT options for real-time beneficiary feedback. Furthermore, experience in operation with irrigation rehabilitation activities in the region, show that citizen engagement activities can be included continuously in project activities for example through participatory monitoring. This requires the establishment of local monitoring group composed of individual farmers, agriculture legal entities operating in the irrigation scheme area etc., to help with the supervision of the works. The local monitoring groups help the ministry/irrigation companies keeping them informed with the progress of works and potential quality issues through a range of communication tools, including telephone, letters, email, WhatsApp, etc.

46. Direct interventions at farmer and service provision levels will be designed and implemented based on gender-representative consultations with direct beneficiaries and other non-governmental stakeholders. Feedback will be incorporated into project implementation procedures to strengthen technical aspects and facilitate implementation. The creation of partnerships between producers, processors and traders in the horticulture and livestock sectors will be based on market demands and needs of the beneficiaries, and this will provide a platform for dialogue and citizens' feedback. Further, to strengthen civic engagement, a systematic feedback mechanism will be institutionalized and become part of the regular project monitoring activities, and a project-specific GRM will be set up and made known to all stakeholders. These approaches will complement and enhance more traditional forms of monitoring. The project will incorporate beneficiary feedback indicators in the results framework to measure beneficiaries' satisfaction with the project supported services.

47. **Gender.** BiH is a signatory of the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW). One of the objectives of the CEDAW is to improve the status of rural women. In this framework BiH is required to improve the socio-economic status of rural women, their access to resources, market and information and access to the basic infrastructure and public services. In RS, to operationalize the RS Strategic Plan for Rural Development 2009-2015, the Gender Center prepared the Action Plan for Improvement of the Status of Rural Women in cooperation with the Ministry of Agriculture, Forestry and Water Management, which was adopted by the Assembly in 2010. The Action Plan was updated with the new Guidelines for New Medium-term Cycle 2017-2022. Of the identified actions for the agriculture and rural development sector, the project will support measures for business activities of rural women and improve gender equality when providing extension services and training programs in rural areas. The FBiH has no specific gender action plan and is directing its activities in accordance with the BiH Gender Action Plan 2018 - 2022.

48. Despite policy efforts, gender inequalities in the Western Balkans remain socially acceptable, especially in rural areas, and women's role as agricultural producers is under-assessed. A more visible presence of gender roles and participations rates is required, as is mainstreaming gender in IPA and similar programs. As long as women's contribution



to the agriculture sector and farm production is not adequately analyzed and described in national statistics and sectoral strategies, measures cannot be shaped and adjusted accordingly to assure that opportunities and potential for women in agriculture are fully realized.

49. Small-scale, subsistence family farmers are invisible to national statistics and the notion remains –even in recent WB projects– that small farms (below 5 hectares) are not sufficiently productive. However, an IFC report on the role of women in agribusiness refutes the claim that small farms are challenged in increasing productivity. The report finds that farms smaller than five hectares account for most of the land and produce significant amounts of food in low- and middle-income countries, and that the productivity of these smallholders is essential in meeting the growing agricultural demand worldwide (IFC, 2016). However, due to collateral requirements, female small-scale farmers continue to face limited access to finance that could be used to improve production, post-harvest treatments and processing by purchasing critical inputs and equipment and hiring additional labor. Studies have also shown that female farmers who receive advice from female extension officers have higher levels of awareness of and participation in extension services (Lahai et al, 2000). Furthermore, the WB BiH Gender Policy Note recognizes that inter alia, better access to information about economic opportunities plays an important role in removing barriers for women participating economic programs. This, coupled with evidence that women often rely on informal information channels for reasons including lack of technology skills, low confidence in receiving advice from men and their self-assessment of eligibility prospects, is seriously affecting women's participation in productive investment program.

50. Desk review data provides evidence that a higher proportion of women work in agriculture sector than men (20.5 percent vs. 16.4 percent). However, amongst people employed in agriculture, there is a lower percentage of women working full time than men (65.9 percent vs 76.3 percent), and women have less average working hours per week than men. As they age, women are much more likely to be involved in unpaid family work than men, with 70.5 percent of women over the age of 45 involved in unpaid family work compared to 20.4 percent of men.¹⁸ These gender gaps in the agricultural and rural development sector are also identified by the recent assessment on Gender Inclusion in Productive Investments in the Western Balkans¹⁹: (a) unequal access to agricultural credit and loans, marketing facilities, appropriate technology and equal treatment in land and agrarian reform as well as in land resettlement schemes; (b) time constrain for women to perform paid tasks as traditionally they are expected to do housework which consumes substantial time during the day; and (c) low awareness of men on how the existing gender gap impacts the agricultural production and resistance to the social change that a gender-equitable extension will entail.

51. The Gender Inclusion in Productive Investments in the Western Balkans also found that, although some World Bank funded programs followed the common practice of awarding women's applicants' additional points in the selection process, other eligibility and selection criteria of the assessed grants favored male applicants and disadvantaged female applicants. As a consequence, the participation by female farmers was diminished. Therefore, specific eligibility criteria for women will be waived if it is determined by the RS MoAFWM and FBiH MoAWMF, who will have specific training and guidance on this, that endemic gender disadvantages played a role in the applicant not meeting that criteria.

52. In addition to the above gap, it has been noted that survey instruments used in recent Western Balkan projects missed the opportunity to produce gender-disaggregated information and analysis to assess the effect of grant measures in agricultural production and on gender roles. Therefore, the interview instruments to be used for baseline and midterm surveys will present all responses as gender disaggregated, categorize female respondents and present responses by typologies, distinguish between the effect of grants vs. capacity building measures, contrast beneficiary and non-beneficiary responses and define what the interventions were. This will be achieved by training the monitoring capacity

¹⁸ Labor Force Survey 2019

¹⁹ World Bank. 2020. Gender Inclusion in Productive Investments in the Western Balkans.



and interview modalities by requesting gender research experience among survey teams, employing female enumerators and extending training to PIUs to ensure improved gender-inclusive future survey designs. The project will design awareness campaigns targeted to women to overcome the barriers in access to information on their opportunities, train and extend a specific cohort of female extension agents, and craft eligibility and selection criteria that enable more women to participate in the matching grant application taking into account the specific constraints for all eligibility criteria. Additional efforts will be made to ensure female staff and women farmers' participation in training and capacity building activities. Gender-disaggregated information will also be collected to help the RS MoAFWM and FBiH MoAWMF to prepare relevant gender-sensitive analyses and policy documents for future targeted interventions.

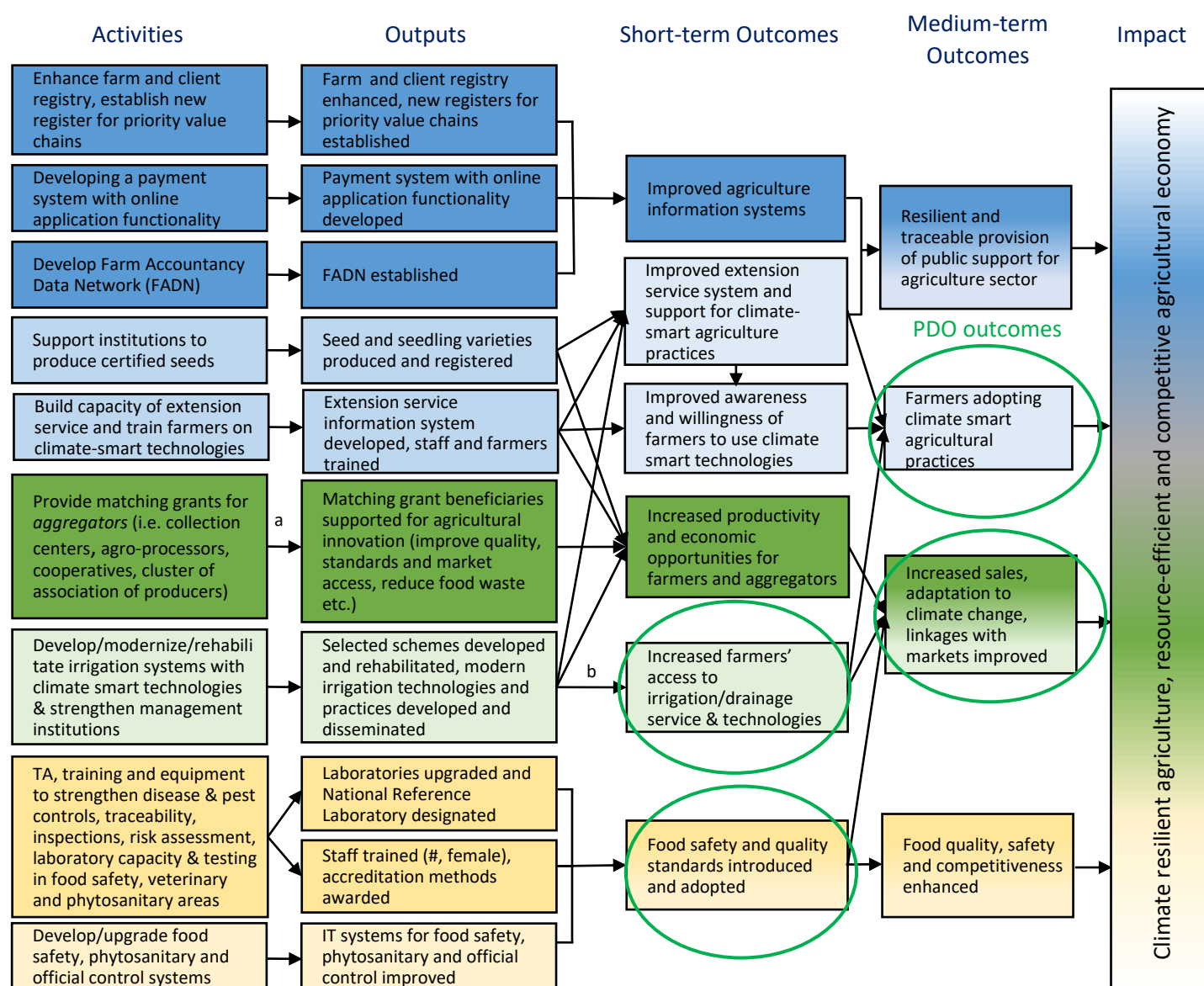
53. The lessons learned and an analytical work is fully reflected in the project design, which has built on the recommendations from the Gender Inclusion in Productive Investments in the Western Balkans report. The project will capture the reduction in gender gaps through the following sex-disaggregated indicators with high targets (a through d, recorded through the project results framework), and women-focused indicators (e): (a) number of female extension staff trained in climate smart production practices and/or technologies, with a target that 50 percent of female staff be trained; (b) number of female veterinary, food safety and plant health staff trained, with a target that 50 percent of female staff be trained; (c) number of female farmers reached with agricultural assets or services, with a target that 30 percent of farmers reached are female; (d) number of female farmers adopting improved agricultural technology; and (e) matching grant information and awareness campaigns targeting women (baseline 0, target 10).

C. Project Beneficiaries

54. Project beneficiaries, of which 30 percent are targeted to be women, include direct beneficiaries (i.e. farmer organizations, private enterprises, aggregators, agro-processors, and collection centers) and indirect beneficiaries (i.e. smallholder farmers operating in the horticultural and livestock sub-sectors in the project areas). The matching grant program will provide technical and financial support to about 30 aggregators (direct beneficiaries) linking with around 1,000 smallholder farmers (indirect beneficiaries) in RS and to about 20 aggregators (direct beneficiaries) linking with around 600 smallholder farmers (indirect beneficiaries) in FBiH. The project will focus on improving the water management in the selected project areas and main beneficiaries would be private farmers using communal irrigation schemes with a minimum cultivable command area of 30 ha. In the public sector, the project will support institutional strengthening of the Ministry of Foreign Trade and Economic Relations (MoFTER), MoAWMF and MoAFWM, Food Safety Agency, State Veterinary Offices, Plant Protection Administrations and Research Institutes, aiming at reaching 50 percent of female extension and food safety staff trained. The nationwide farmers and enterprises will benefit from the support provided to the public institutions.



D. Results Chain





E. Rationale for Bank Involvement and Role of Partners

55. **Rationale for public sector provision/financing** The project will address a number of market failures: (a) the difficulties of small scale producers to access markets notably EU export markets and deficient links between them and formal agribusinesses/ traders/ exporters/ input suppliers; (b) the difficulties of smallholders and of value chain actors to access investment financing and the inability of existing finance institutions in BiH (commercial banks and microfinance institutions) to provide adapted short to medium term value chain finance products (to boost technology adoption and marketing of production); (c) deficiencies of smallholders access to improved technologies, information, knowledge, certified improved planting material/breeds and other agricultural inputs, etc. The project also has a redistribution role as it targets groups (smallholders) that are somewhat excluded from the mainstream financial and commercial markets and commodities/value chains that have a large potential for making small scale family farming more profitable and business oriented. It perfectly fits into the BiH policy agenda aiming at transforming agriculture into a sustainable and commercially-oriented business, while protecting the environment and conserving the country's natural resource base, improving the resilience of fragile ecosystems to climate change, adapting them and value chains to climate change, combatting rural poverty, promoting human rights and democracy, sustainable and integrated development including through decentralization and promotion of local and demand-driven development approaches. Therefore, public intervention is fully justified and the proposed project as an Investment Project Financing (IPF) is thus an appropriate instrument to achieve the PDO and the project intermediate results.

56. **Value added of the Bank's support.** The project brings significant value added from the BiH and development community standpoint. Beyond financing, the added value arises from technical support based on international experience for similar: integrated institution and capacity building (of both public institutions and smallholders/value chain actors) projects; value chain development/productive partnership projects; irrigation development projects.

57. The World Bank Group has extensive experience internationally, in the Western Balkan region, and in BiH in supporting different agents of the agriculture sector, enhancing competitiveness and market integration, and strengthening agricultural public-sector institutions. In particular in the Western Balkans, Bank funded projects have implemented successfully an incremental approach towards meeting EU requirements.

58. The World Bank also has developed strong relations with most of the development partners active in BiH, including the EU, UNDP, USAID, and IFAD, and could use the proposed project to leverage their operations and benefit from other partners technical assistance support.

F. Lessons Learned and Reflected in the Project Design

59. Project preparation has benefitted from the implementation experience of several similar projects as well as analytical work in the agricultural sector in countries of the Western Balkans with objectives associated with EU pre-accession or/and EU accession requirements, including in Croatia, Kosovo, Montenegro, Serbia, and North Macedonia. Projects include Kosovo Agriculture and Rural Development Project, and Montenegro Institutional Development and Agriculture Strengthening (MIDAS) and Second MIDAS; as well as the previous investment operations in BiH, namely ARDP, and IDP. Analytical work includes Agriculture for Jobs and Growth in the Western Balkans (2017); Exploring the Potential of Agriculture in the Western Balkans (2018), Gender Inclusion in Productive Investments in the Western Balkans (2020); and The Future of Water in Agriculture in the Western Balkans: The Irrigation and Drainage (Eco)system Approach (2022).



60. The key lessons from these activities have been reflected in the project design, including (a) addressing sector weaknesses in a holistic manner at institutional, administrative, regulatory, and production levels to comprehensively foster agriculture sector competitiveness; (b) timely investments in strengthening capacity of the agricultural/rural development agencies in meeting EU accession requirements; (c) investment support to farmers and aggregators in upgrading their activities in line with EU food safety, environmental and animal and plant health standards, climate change mitigation and cross-compliance requirements; (d) supporting the development of market driven agri-food production models and establishing market linkages in addition to providing support to reach compliance with market standards; (e) provision of demand-driven training for farmers and aggregators to enhance the effectiveness and impact of training workshops; (f) investment, training and extension services to promote climate smart agriculture for a green transition into higher agricultural productivity, increased resilience and lower emissions; (g) investments in irrigation taking into consideration agricultural value chains, institutional and financial arrangements to ensure delivery of services; and (h) formally bringing in cantons/municipalities early in the selection process of irrigation schemes to be supported by the project to expedite the permit issuing process.

61. In particular with regard to the design of the irrigation activities, one of the key lessons is the adoption of the irrigation and drainage (eco) system approach to:

- (a) Better customize and integrate irrigation and drainage infrastructure and non-infrastructure investments to the constraints and needs of different farming systems, to diverse agroclimatic zones, and to the systemic and cross-sectoral factors that influence and impact outcomes in the irrigation and drainage sector. The integrative aspects of the approach can be conceptualized at different scales and may take different dimensions including: (i) integration within the basin: water security, water stewardship, multiple services on site and in the basin; (ii) interconnectedness between water and agriculture and food systems: supporting a range of farming systems from small scale to commercial producers and tailored approaches to each – linking climate risk management in agricultural production with other forms of risk management (insurance, trade, phytosanitary, agro-environmental measures, other market based mechanisms); and (iii) integration of water policy objectives into other policy areas and delivery mechanisms: coordination between tiers of government as well as between sectors; and between government and private sector;
- (b) Proactively ensure the optimal utilization of the improved or new irrigation and drainage potential created. It is important to understand that investments in large scale public irrigation schemes are seen as public goods which are traditionally under the domain of the water sector, while on-farm irrigation is considered private and supported by agricultural or rural development policies. The sectoral silos associated with the irrigation, drainage, and agriculture sectors can lead to a disconnect between scheme-level physical infrastructure interventions versus agriculture focused on-farm or field-level interventions. This disconnect poses a major obstacle to BiH due to weak alignment across the sectoral investment strategies, particularly at lower administrative level;
- (c) Improve performance monitoring and metrics of success. Identification and application of holistic performance indicators that goes beyond narrow physical criteria and account for the dynamic, multi-scale, and multi-dimensional nature of the irrigation and drainage (eco)system including agricultural productivity, sustainable water use in agriculture, environmental sustainability, climate resilience, etc.;
- (d) Diversify irrigation service delivery model including support to private irrigation. In multi-user or public irrigation systems a move towards on-demand irrigation water services is encouraged to enable the flexibility, reliability, and adequacy of irrigation water supply. This also includes support to farmers in multi-user irrigation schemes who are making investments and innovating to valorize the irrigation and drainage infrastructure through for



example conjunctive use of surface and groundwater resources;

- (e) Diversify institutional models for irrigation and drainage operation, management and maintenance which are fit-for-purpose;
- (f) Apply innovative financing models including performance oriented fiscal transfers to municipalities and results-based financing of individual projects or programs. This also entails changes in metrics of success or performance monitoring to set the service provider on a path towards providing reliable, safe, inclusive, transparent, and responsive irrigation and drainage services; and
- (g) Enhance partnerships at local administration and entities levels to leverage financial resources, harmonize policies, coordinate investments, and ensure the principle of financial additionality. It focuses on creating clear institutional responsibility, accountability, effectiveness and regulations.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

62. Day-to-day responsibility for project coordination and administration will rest with the MoFTER, the FBiH MoAWMF and the RS MoAFWM. The MoFTER, through the Assistant Minister appointed as Project Coordinator, will be responsible for overall project coordination within participating ministries/agencies and monitoring and reporting. It will compile semi-annual progress reports (based on entities' reports), including the monitoring framework, and submit them to the Bank.

63. The main responsibility for implementation will be with the FBiH MoAWMF and the RS MoAFWM and their respective implementation units, the FBiH Project Implementation Unit (PIU) and the RS Agriculture Project Coordination Unit (APCU). The Assistant Minister in FBiH and Adviser to the Minister in RS have been appointed as the respective Project Coordinators. The Ministries have a good record of implementing projects financed by the Bank and other externally financed agriculture sector projects. In addition, well-functioning and experienced project implementation units – the APCU in RS, and the PIU in FBiH - have served as the focal units for the preparation and implementation of agriculture and irrigation projects. The APCU and PIU have professional staff for agriculture and water management, and for procurement, financial management and general project management and oversight. The units will benefit from additional capacity building and external support of qualified and experienced environmental and social development consultants to support project implementation and compliance with ESF requirements throughout the life of the project. Furthermore, the project may support additional technical capacity required for the implementation of the proposed project.

64. A joint Technical Working Group (TWG) has been established to provide technical guidance and coordination of the various project activities during project implementation consisting of representatives of the following existing counterpart institutions/agencies which will be responsible for implementation of project activities: MoFTER, with the Veterinary Office of Bosnia and Herzegovina (VOBiH), and the Administration for Plant Health Protection (APHP), the Food Safety Agency (FSA), FBiH MoAWMF, FBiH Inspectorate, RS MoAFWM and RS Inspectorate. These counterpart agencies or institutions will be responsible for preparation of terms of reference and technical specifications, preparation of training programs, supervision of consultants and advisors, among others. The TWG will be led by MoFTER and it is



planned that it will meet every quarter and on an as needed basis during the first two years of project implementation and less frequently thereafter. Participation to the TWG may be extended to project stakeholders and beneficiaries including representatives of cantons and municipalities, WUAs, farmers organization, processors, research institutions, etc. according to the topics to be addressed in the meetings.

B. Results Monitoring and Evaluation Arrangements

65. The Project's Monitoring and Evaluation (M&E) system will be aligned with the Results Framework and Theory of Change presented above. M&E activities will focus on: (a) continuous data collection for the Results Framework and related indicators; (b) regular results monitoring of all project component activities; (c) a Mid-Term Review; and (d) an end-of-project impact assessment. Data collected during project preparation will serve as baseline for some indicators, while for others, baselines will be established early in project implementation and will be compared against follow-up data collected during and at the end of project implementation.

66. M&E of various activities will be coordinated among MoFTER and the entity-level line Ministries. In the FBiH, the cantons will play a role in providing feedback for monitoring and evaluating the impact of improving irrigation and drainage systems as well as the extension services. The M&E specialist under the MoFTER will be responsible for updating the Results Framework. S/he will compile all the information obtained from the Entities and present the data in coherent semiannual progress reports that will be provided to the MoFTER, the entity-level Ministries, and the Bank. This information will be further reviewed and confirmed by regular Bank supervision missions. Based on the data obtained, implementation and activities may be adjusted, or re-sequenced to take into account implementation experience. The M&E system will also capture grievances and establish linkages with CE activities to inform citizens about project progress and impacts.

C. Sustainability

67. The sustainability of project activities beyond the implementation period is expected to be high. Project activities will help BiH to build the capacity of the entity-level and the BiH agencies to become EU compliant including through achieving compliance of IT systems with EU pre-accession requirements. Increasing the institutions' capacities as well as establishing the required systems will help BiH access future EU funding for agricultural and rural development under the Instrument of Pre-accession Assistance.

68. The project will support the development of sustainable agriculture value chains and the enhancement of an effective food safety system and 'One Health' approach. Any productive technology, equipment, or infrastructure financed through the subprojects supporting private agribusiness investment in value chains under sub-component 2.1 will be accompanied by well-conceived business plans to ensure economic sustainability. These will clearly lay out the arrangements and division of responsibilities between partners regarding production, operation, management, and maintenance. Support will be provided all along the investment cycle from design to implementation until subprojects achieve their expected performance. The project will give priority to investments promoting climate resilience, such as investments in climate-smart technologies and practices including sustainable land management and increasing diversification of income resources through better integrated value chains strengthening the resiliency of the selected sub-sectors. The project will also give preferential treatment to vulnerable groups such as women and youth, so they can develop sustainable ventures. Sustainability will also be ensured through better market orientation of products in investments supported under the project.



69. For the irrigation schemes to be supported under sub-component 2.2, the project will facilitate signing tripartite O&M agreements among the end beneficiaries/WUA, the ministry/canton (assets owner), and the municipality/utility (i.e. the O&M service provider), to ensure the sustainability of introduced off-farm infrastructure/facilities. In addition, the project will strengthen the extension units of FBiH MoAWMF and RS MoAFWM, including helping farmers in target schemes to access credit or subsidies for the on-farm equipment and for optimal water use, which could improve resilience to climate change.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

70. Development of an agriculture information system, including upgrading of the FCR, development of a payment system and strengthening the exiting agricultural information system and related GIS components, will help with bringing transparency and traceability of agricultural payments. Introduction of the FADN will help with collecting data and analyzing the impact of agriculture support, optimizing policy design and ensuring the more efficient use of public funds. Improved institutional capacity for the analysis, planning, and programming in the agriculture sector is expected to lead to a better allocation of public expenditures.

71. Investments through matching grants will address market failures and promote green and effective value chains, providing access to seed and nursery materials for better quality of planting material, more efficient technology transfer, including for pests and diseases control measures to reduce production losses, improve quality, and protect existing high value orchards.

72. The project supports five broad outcomes: (i) increased productivity and diversification of agricultural production; (ii) increased knowledge and adoption of climate-smart agriculture practices, and enhanced resilience of agricultural production to climate change; (iii) improved integration of smallholder farmers into green and effective value-chains with greater gender equality; (iv) improved agriculture water management and introduction of climate-smart irrigation technologies; and (v) improved food safety and quality standards, and increased competitiveness and potential to access higher value markets.

73. These outcomes contribute to agricultural and economic growth, improved food security and nutrition, poverty reduction and shared prosperity – all of which are public goods. Public financing to increased productivity and diversification of agricultural production is therefore well justified. The project support to enhanced climate resilience will yield both adaptation and mitigation co-benefits, which are global public goods and thus merit public financing. The outcomes also contribute to improved water planning and water management and reduce the agriculture's footprint in overall water use given the project's attention to water saving technologies and production measures.

74. Modernizing and upgrading farming is needed to achieve greater productivity, higher quality of produce, lower losses, and higher incomes for farmers and traders. This would help strengthen BiH's export-oriented segments in the agriculture, boost export revenues, and contribute to the creation of new jobs in the rural areas.

75. Irrigation and Drainage is essential for higher productivity and greater resilience through stabilizing production, extending the growing season, reducing fertilizer cost, and increasing water productivity. In order to increase irrigation coverage and irrigation efficiency, a number of issues need to be addressed. The project would support (a) institutional



support for improving irrigation service delivery performance and financial sustainability of irrigation management at the system level; and (b) investments in selected irrigation infrastructure and in promoting closer linkages between irrigation system development and on-farm agriculture modernization.

76. **Technical.** The technical design of the matching grants program builds on lessons learned and experience of the Bank in other countries, including in the region, implementing similar programs, as well as the experience of UNDP and USAID/PHARMA II project implemented in BiH. Subcomponent design is expected to foster the integration of smallholder producers in selected value chains. The project will support aggregators, i.e. private collection centers and agro-processors, who will promote the integration of small-holder farmers through the provision of supply contracts for inputs and extension services enabling them to enhance their productivity as well as product quality (including meeting Global Good Agricultural Practices certification requirements). Targets will be set for female participation and benefit, and eligibility and selection criteria will be crafted in a way that enables more women to apply for grants. Farmers will benefit from improved access to innovative technologies to increase their farm productivity. Input support will be complemented with training and advisory services to assist farmers with sound implementation of the new technologies. The improving of access to knowledge, inputs, markets, and associations will also enable more women producers to participate in the value chains.

77. The irrigation and drainage engagements will build on the experience and work completed in the recently completed IDP. Many of the existing irrigation and drainage networks remain in disrepair due to long years of neglect of maintenance routines. The scope for the development of new areas has to be further explored, particularly in FBiH, and could be limited due to limitations on technical options and water quality. RS has developed a framework for long-term development of irrigation and drainage. It estimated that some 131,354 ha could be irrigated but only 72,245 ha were found suitable for future development under the framework. Details and maps for every potential site are provided, including investments required.

78. Channel drainage networks are estimated to need 982 km of secondary and primary drainage canals for the 72,000 ha to be developed according to the plan. FBiH does not have an Irrigation development plan. But two River Basin Management plans exist that contain brief sections on irrigation development but without specific identification of sites or projects. Drainage is a high priority because of the frequent floods and waterlogging of the plains which often are the best land for irrigation. Some rivers are very polluted as only 2 percent of the wastewater is treated. Municipalities are responsible for wastewater treatment. Thus, the project will identify priority schemes for investment based on the River Basin Management plans, and defined selection criteria linked with agriculture productivity and competitiveness.

79. **Financial Analyses.** Financial analyses have been conducted to estimate the ex-ante feasibility, risks and returns of the productive and economic activities and investments supported under component 1 and 2 for which benefits can be quantified. It looked at: (a) the attractiveness of proposed irrigation improvements to participating smallholders in terms of additional agricultural income accrued to them (net of additional irrigation fees) based on representative crop, farm and scheme models that reflect changes in yields, cropping pattern, land use, market orientation etc., and the likely viability to ensure a sustainable operation and maintenance of the scheme; (b) the attractiveness and viability of typical sub-projects/business plans for productive partnerships in targeted value chains from their beneficiaries (aggregators) view point, in terms of increased net cash income likely to accrue to them; assessing the possibility for existing potential aggregators to actually participate in co-funding the sub-projects/business plans as proposed and to attract funding from national finance institutions (to fund part of the sub-project promoter own contribution to meet the sub-projects' investment costs and working capital requirements). For *irrigation schemes*, financial analyses were conducted from the standpoint of the owner and operator of the scheme, e.g. the entity (FBiH or RS) and municipality or public company in charge of running the scheme (including collecting water fees from users and organizing operation and maintenance of



the scheme and the replacement of the investment items after their life period). For two proposed schemes for which detailed studies were prepared (Žepče and Živinice schemes in FBiH), projections show that the yearly income of the scheme operator (from water fees) is above the yearly operational costs of the scheme; and will generate enough cumulative cash flow to bear the cost of replacing assets when needed. The analysis was conducted over 30 years, taking into consideration annual maintenance costs in line with recommended standards (ranging from 0,5 percent to 3 percent of the investment cost, depending on the item), the cost of staff in charge of the scheme management and variable costs, in particular electricity costs. In addition, verifications were made to ensure that proposed water fees represent an affordable cost to irrigators (ensuring that incremental net income per ha substantially exceeds the water fee) and thus can be borne by irrigators. For *value chain sub-projects*, a cash flow was elaborated to estimate the results of investing in a large warehouse (600 m². 300 MT capacity) and modern handling equipment (BAM 1 million total investment) to increase the turnover of an agricultural cooperative that recently embarked on fruit and vegetable bulking and marketing. This model, based on a limited sales margin applied to the purchase of products from cooperative members, shows good prospects for growth and positive financial results with a financial rate of return above the financial cost of capital and a cumulative cash flow that allows to meet the operational costs and the replacement of assets.

80. **Economic Analysis.** The economic analysis assessed the development impact of the project from the national economy standpoint through a cost-benefit analysis approach.

81. *Project development impacts.* Economic benefits expected from the project are: (a) increased agriculture productivity and production through upgraded and reliable irrigation infrastructure and services delivery, adoption of improved irrigation and other CSA/climate-resilient technologies and better farming practices (GAP and IPM), enhanced quality of agricultural produce, expanded cultivated area under improved irrigation and drainage, and facilitated access to markets; (b) reduced post-harvest losses at field level and along the targeted value chains; (c) water savings and increased water productivity (both in physical and monetary terms); (d) increased average producer prices and greater share of benefits accruing to them thanks to strengthened producers' organizations, market promotion activities, linkage of smallholders with traders/aggregators, value chain platforms, and enhanced technical and managerial capacity of producers/ value chain actors and their organizations; (e) expanded market opportunities (notably for export to EU and beyond) offering higher and more stable prices and increased volumes, thanks to legislation adaptation, compliance with international standards and processes and capacity building of producers and value chain actors; (f) improved food safety benefiting both producers and consumers and associated reduced occurrence and severity of illness caused by food poisoning, zoonotic diseases, residual content in food products (toxins, heavy metals, etc.); (g) improved plant and animal health and soil health; (h) additional employment generated at both farm and off-farm level and downstream of the targeted value chains; (i) increased incomes of direct and indirect beneficiaries; (j) increased fiscal revenues resulting from higher turnover of targeted smallholders, aggregators and other value chain actors; (k) net Green House Gas (GHG) emissions as a result of adoption of improved irrigation and farming practices and CSA/climate-resilient technologies; and (l) improved agricultural water management in the medium and long run thanks to strengthening technical and institutional capacity of irrigation managing agencies, WUAs, municipalities etc. including through adoption of digital tools to increase efficiency of public service delivery.

82. *Economic benefits considered in the analysis.* Activities under subcomponents 1.1, 1.2, 2.1, 3.1 and 3.2 are well identified in scope and nature; however, their potential benefits are mostly non-quantifiable. The project benefits that can be quantified in the economic analysis are those derived from: (a) value chain development sub-projects under subcomponent 2.1, keeping in mind these will be strictly financed under a demand-driven basis thus forecasting and quantifying benefits from these sub-projects is highly hypothetical; (b) irrigation improvements under subcomponent 2.2 (incremental net value of agricultural production); and (c) the value of net GHG emissions reduction.



83. **Results.** The economic returns of upgrades of selected irrigation schemes proposed for financing under the Agriculture Resilience and Competitiveness Project (ARCP) were estimated over 30 years, considering the specific scheme investments and operational costs, forecasted yield increases, input/output prices and changes in cropping pattern specific to each location, but also environmental benefits such as non-use value of improved surface and ground water quality. Calculations made for the Žepče scheme (169 ha) indicate this sub-project would yield an economic rate of return (ERR) of 32 percent, an economic net present value (ENPV) of BAM 25 million, and a benefit/cost (B/C) ratio of 5.3, clearly demonstrating its economic viability. Assuming this scheme is representative, *sub-component 2.2* would yield an EIRR of 29 percent and an ENPV of EUR 125 million. Results of the sensitivity analysis show a very strong resilience to increases in cost and reductions or delays in accruing benefits. The EIRR would still establish at respectively 21 and 17 percent in extreme cases in which costs would be increased or benefits would be reduced by 50 percent. For *sub-component 2.1*, a typical incremental cash flow profile generated by one euro of matching grant was developed based on experience in funding similar types of sub-projects; a failure rate of 20 percent was considered to cater for the fact that some funded sub-projects might not accrue any additional economic benefit (i.e. their net additional income in the "with project" situation would only offset the investment costs). Based on these assumptions, and taking into consideration all subcomponent economic costs, the matching grants scheme would yield an ERR of 19 percent and an ENPV of EUR 9 million. *GHG emissions reduction* were estimated at 610,938 tons of CO₂ equivalent over 25 years, which would translate into an economic value of EUR 21 to 41 million using a low or high shadow price of carbon (SPC) (EUR 11 to 22 million respectively after discounting). It represents a small share in the overall project economic benefits (respectively 6 and 11 percent of total economic benefits considering low and high SPC).

84. The *overall project economic* return has been estimated considering all project costs (although no benefits could be accounted for components 1, 3 and 4). Without GHG benefits, the project would yield an EIRR of 20 percent and an ENPV of EUR 116 million. Adding GHG benefits, the EIRR and ENPV would establish at respectively 21 to 22 percent and EUR 127 to 138 million (using respectively low and high SPC). Sensitivity analyses show that a very strong resilience to increases in costs and reductions and delays in benefits on the "base scenario" (that considers all project costs and GHG benefits at low SPC): even in the extreme (and unlikely) case of benefits being reduced by 50 percent, the EIRR would still establish at 11 percent and the ENPV would be EUR 36 million. These results should be considered with caution. First, there is a high variability in investment costs, water requirements, production pattern and systems, access to markets etc. between irrigation schemes envisaged to be upgraded under the ARCP, thus the few ones for which a cost-benefit analysis (CBA) is available might not be representative; and sequence in which these schemes would be supported is not yet known, making aggregation of benefits hypothetical; thus the need to carry out a thorough financial and economic analysis for each proposed scheme (showing positive results is an eligibility criteria for financing). Second, expected returns from value chain development sub-projects vary depending on the type of funded activity (ranging from bulking raw products with limited margin to upgrading processing lines, enhancing energy efficiency of processing plants, branding and marketing support, etc.). The project needs to systematically prepare sound business plans including both a financial and economic analysis for each sub-project.

85. **Fiscal Impact.** In the short-term, the fiscal impact of the project is likely to be neutral, given that the counterparts contribution to project costs is expected to be very limited (as the loan would finance 100 per cent of costs - except for sub-projects and irrigation schemes upgrade for which a minimum contribution of respectively 35 percent and 10-15 percent will be requested). In the medium to long-term, however, the potential fiscal impact of the project might be positive, due to: (a) increased output, income and more formal employment, resulting in increased tax revenues; and (b) multiplier effects due to increased economic activities in target areas, and subsequent sustained demand for goods and services, which is expected to generate additional income and employment effects.



B. Fiduciary

Financial Management

86. **The existing budgeting, accounting, reporting, internal control, staffing, funds flow and audit arrangements of the PIU and APCU have been assessed.** Subject to implementation of the agreed action plan laid out below, these Financial Management (FM) arrangements are considered to meet the minimum requirements of the WB Operational policies. These actions include: (a) strengthening of the FM staffing in the FBIH PIU following natural attrition; (b) updating existing FM sections of the Project Operational Manual (POM); (c) maintaining the project accounting software license for the new project; and (d) preparation of the Matching Grants Manual.

87. **The PIU and APCU will prepare quarterly interim financial reports (IFRs), which include Sources and Uses of Funds, Uses of Funds by project Activity, Statement of Financial Position, Designated Account (DA) Reconciliation Statement and Statement of Expenditure (SOE) Withdrawal Schedule.** The PIU and APCU shall prepare and furnish to the Bank not later than forty-five (45) days after the end of each calendar quarter, IFRs for the project covering the quarter, in form and substance satisfactory to the Bank. Thus far, the Quarterly Interim un-audited Financial Reports (IFRs) have been submitted by both PIU and APCU regularly to the Bank and were found acceptable.

88. **The PIU and APCU will be responsible for the timely compilation of the annual project financial statements for the independent external audit.** Project financial statements (including SOE and DA, activities) will be audited by an independent auditor acceptable to the Bank and contracted by the Ministry of Finance and Treasury of BiH. Each audit of the Financial Statements shall cover the period of one (1) fiscal year of the Borrower, commencing with the fiscal year in which the first withdrawal was made under the Loan. The scope of the Project financial audit will be extended to include the audit of the ARCP matching grant scheme. The terms of reference for the audit have been agreed with the Bank and will be attached to the Minutes of Negotiation. In addition, the auditors are expected to deliver management recommendation letters in relation to the project. Each management recommendation letter will identify internal control deficiencies and accounting issues, if any. Audit reports, audited financial statements, and management recommendation letter will be delivered to the Bank within six months of the end of each fiscal year. The audited Project Financial Statements will be made publicly available in a timely fashion, and in a manner acceptable to the Bank. The PIU and APCU have thus far received unmodified audit opinions on their project financial statements and the management recommendations letters have only reported some minor accounting issues.

89. **The overall FM risk rating is assessed as moderate after application of the mitigation measures.** Some of the mitigation measures will include use of experienced staffing arrangements, acceptable internal controls system, adequate planning and budgeting as well as reporting and auditing arrangements, updating of the FM sections for the POM etc.

Procurement

90. **Procurement under the project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers** “Procurement in Investment Project Financing for goods, works, non-consulting services and Consulting Services” (July 2016, revised Nov 2017, Aug 2018, and Nov 2020). The project will also be subject to the World Bank’s Anti-Corruption Guidelines, dated July 1, 2016, and further will be governed by the provisions stipulated in the Project Agreements (PAs) with respective entities. The PIUs in each entity will use the Systematic Tracking of Exchanges in Procurement (STEP) system. STEP is a planning and tracking system, which would provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance.



91. **The PIU and APCU have implemented several Bank-financed projects and have adequate procurement capacity with dedicated and experienced procurement specialists.** Based on the procurement capacity assessment conducted for the PIUs in charge of project implementation in the respective entities, the World Bank concluded that (i) procurement arrangements in the FBiH PIU and APCU are acceptable to the Bank and (ii) the procurement risk is moderate.

92. **Project Procurement Strategies for Development (PPSDs) have been prepared by each PIU,** to outline the selection methods to be followed by the borrowers during project implementation in the procurement of goods, works, and non-consulting and consulting services financed by the Bank. The entities' specific Procurement Plans will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The identified risks and the mitigation measures are detailed in the PSDs. Annex 1 of the PAD includes a summary of the PSD and details on the procurement arrangements and assessments for each entity.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

93. As development of new and rehabilitation of existing irrigation and drainage systems is envisioned under sub-component 2.2 and BiH is within an international river basin, the policy on international waterways is triggered. On June 22, 2021 notification was sent to Croatia, the International Commission for the Protection of the Danube River (ICPDR) for activities in the Sava Basin, and the International Sava River Basin Commission. As of July 22, 2021, which was the deadline set out in the notification letter sent to the riparian countries to respond on the project, responses have been received from the Republic of Croatia, confirming no objection to the proposed Project and from the ICPDR confirming that it has no comments on the project. All policy requirements of OP 7.50 have been completed.

D. Environmental and Social

94. The project's assessed risks are Substantial for both environment and social aspects. Its anticipated environmental impacts will be largely mitigated and managed through adequate due diligence to be prepared based on the initial screening and in line with the project's Environmental and Social Management Framework (ESMF) developed in line with the Environmental and Social Standard (ESS) 1 - Assessment and Management of Environmental and Social Risks and Impacts, ESS2 - Labor and Working Conditions, ESS3 - Resource Efficiency and Pollution Prevention and Management, ESS4 - Community Health and Safety, ESS5 - Land Acquisition, Restrictions On Land Use And Involuntary Resettlement, and ESS10 - Stakeholder Engagement and Information Disclosure. There will be no impacts on protected areas and habitats, and cultural heritage and high-risk activities will be screened out from being financed. The issue of water quality and use will be addressed through the preparatory documents and in meeting OP 7.50 on International Waterways, where needed. The other associated impacts deal with small scale construction and include dust and noise, workers occupational health and safety (OHS), site access control, traffic management, waste management that can be readily mitigated and monitored. The project activities will be subject to a screening out high-risk activities and assigning adequate due diligence based on the assigned risk category for the grants, and for the proposed irrigation activities under Component 2.



95. The environmental risks associated with the proposed project are assessed as Substantial. Although the long-term impacts of the project are likely to be positive, its activities carry several risks that are mainly generated by the activities under Component 2. The matching grant activities to be supported under Component 2.1 include small-to medium-scale civil works which will more than likely have a number of predictable and readily mitigated environmental impacts that will most likely be moderate in nature. The anticipated impacts under this component would include dust and noise, small-scale water pollution from improper handling of waste and machinery, workers OHS, and waste management. However, under component 2.2, taking into consideration the nature of the irrigation projects and their location, as well as the international waterways as water sources, these activities may be considered as those with substantial risk. It is expected that they will likely generate adverse site-specific risks and impacts, such as disposal of material excavated during construction/rehabilitation activities, the OHS of workers during construction and operational phases, increased levels of dust and noise and community health and safety risks from, in particular, the risk of pollution to surface and groundwater sources during construction. Potential negative risks could be associated with the replacement of the old water irrigation systems containing asbestos material, and therefore, the project will analyze all respective sites and decide about the best options to be applied. The fact that the activities under the matching grant scheme will be subject to a separate Matching Grants Manual will allow for activities of high risk to be screened out and excluded from the project. The types of high-risk activities would include irrigation activities where potential riparian issues could arise related to water use; new development of water supply sources or large dams for irrigation schemes; or extensive and elaborate irrigation schemes that are located within or in the proximity of sensitive environments or could be further expanded in the future. The project will also aim to improve the use of agrochemicals, promote integrated pest management mechanisms, and will improve the overall administration and organization of the agricultural sector in BiH. The irrigation activities under Component 3 will also fall under the ESMF and preparation of adequate due diligence documentation will be carried out for each of the proposed sites.

96. Separate Stakeholder Engagement Plans (SEPs) have been prepared, one for each of the two Entities (FBiH and RS) as a critical part of documents ensuring that meaningful, timely and adequate stakeholder engagement takes place. Given the ongoing challenges and the fluidity of the pandemic situation the SEP has taken a recalibrated approach of adapting the engagement practices tailored to meet the objectives by taking advantage of technologies and exploring options to incorporate electronic communication platforms to enable outreach and feedback all at the same time, often in real time. Despite the constraints, the project remains fully committed to stakeholder consultation and citizen engagement.

97. Social impacts and risks are predictable with the majority of them temporary, apart from those stemming from land acquisition needs. They can effectively and readily be managed through the project design features and instruments. However, as preparation and fact-finding activities were constrained due to COVID-19 imposed restrictions, the magnitude of impacts stemming from land acquisition and involuntary resettlement could not be screened. Similarly, existing land use patterns including the scale of informal land users and occupants in potential project areas could not be identified. The social risk is therefore rated as Substantial.

98. Component 1 - Social risks are in general moderate because the component would primarily support awareness raising on climate risks and available extension services. Labor risk is low as labor will mostly be provided by skilled, highly educated and experienced consultants who are overall not vulnerable to discrimination or unfair treatment. Climate awareness raising tools for farmers should be sensitized geographically and to sub-sectors of agriculture to ensure equitable outreach.

99. Component 2 - Social risks of this component are overall substantial, due to sub-component 2.2 that aims to improve irrigation and drainage systems. These activities will require involuntary land acquisition and resettlement and



require civil works. The scope and magnitude of such impacts is known only for one sub-project in RS (Skelani, Srebrenica) for which a Resettlement Action Plan has been developed and disclosed on July 12, 2021.

100. Sub-Component 2.1 is expected to have moderate social risks as the expected business activities supported under the sub-component would have only site specific and predictable impacts. Social risks mostly arise due to the prevalence of labor informality in the agricultural sector. Labor risks will be managed through contractual enforcement of labor laws and mechanisms to minimize informal and disguised labor that will be developed during preparation and included in the ESMF.

101. Vulnerable and disadvantaged groups (young farmers, women, agri-stakeholders living in geographically remote and challenging areas with low ICT knowledge or internet coverage, etc.) are likely to have inequitable access to project support. Those groups are often unable to achieve eligibility to access the grant-schemes which is why the Matching Grants Manual will sensitize eligibility criteria and include qualifying criteria to reduce exclusion of these vulnerable groups.

102. Gender-based violence (GBV) risks associated with the project and in BiH are low. Nevertheless, the Grievance Redress Mechanism (GRM) shall be strengthened with procedures to handle allegations of sexual exploitation and abuse and sexual harassment. Environmental and social risks associated with the project will be addressed through the project ESMF integrating provisions of Integrated Pest Management, Labor Management Procedures (LMP), Resettlement Policy Framework (RPF), SEP (including GRM) in line with applicable Environmental and Social Standards (ESS) of the WB's ESF. In addition, the WHO COVID-19 guidance tools will be used to appropriately manage pandemic risks associated with stakeholder engagement activities and labor and workforce. The Borrower will commit to these through the Environmental and Social Commitment Plan (ESCP). The package of due diligence documents includes a single shared ESCP, while the ESMF, ESMPs for known project activities, SEPs, LMPs, RPFs and a Resettlement Action Plan for known project activities have been adopted separately for each of the two entities. The two sets of due diligence documents alongside the single shared ESCP were disclosed on July 8, 2021 followed by newspaper announcements on July 9, 2021 in FBiH and July 12, 2021 in RS respectively, with virtual consultations held.

103. The project includes budget for outreach activities and community engagement strategies related to all components particularly component 2, guided by the SEP, to minimize the risk of exclusion of vulnerable individuals and groups, both with regard to accessing project benefits but also to be included in the project M&E.

104. Citizen engagement is embedded in the project design and essentially relies on the pillars of feedback and two-way communication mechanisms. This will ensure that beneficiaries are provided with an avenue to provide feedback to the design and rollout of the project. This is particularly critical for the matching grants, which, based on experience in BiH and the region, would enable the most adequately tailored outreach, selection and feedback. Potential adaptation of the entire process and further tailoring responding to recipients needs would also reside on the quality of how the feedback was solicited and ultimately taken into account in project design.



V. GRIEVANCE REDRESS SERVICES

105. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

106. **The overall risk of the project is considered moderate.** The considerations made for each risk category are presented below.

107. **Political and Governance risk associated with the project is rated moderate.** On the political side, while it may be possible for political issues to have spillover effects that may impact project activities, overall the agriculture sector enjoys common intent, given that agriculture produce requirements and standards have to be implemented throughout BiH. No major governance issues emerged during the implementation of the ARDP and IDP, which were largely dealing with the same institutions and were implemented with similar arrangements.

108. **Macroeconomic risk is considered substantial.** The BiH economy which was already subject to a slowdown faces a deep recession due to the coronavirus outbreak impacting the economic activities across all sectors. In particular, the risk of a slowdown of macroeconomic and trade reforms could negatively affect the export-oriented agricultural subsectors. This risk will be mitigated by policy dialogue for continued economic reforms.

109. **Sector Strategies and Policies risk is considered moderate.** Agricultural reforms could slow down, reducing the rates of economic return from investing in agricultural public goods. This risk will be mitigated by focusing on strengthening delivery of selected services, which would bring about positive outcomes even in the slow-reform environment. It will also be mitigated by making sure that the project does not overinvest in selected programs, but finances only essential activities that are economically justified and would make a difference on the ground.

110. **Technical Design of Project or Program risk is considered moderate.** The design of the project has benefitted from extensive lessons learned from previous projects implemented in BiH, namely ARDP and IDP, and in other countries in the region covering similar activities, i.e. enhancing the capacity and aligning the agriculture information systems to EU requirements, implementing matching grants both in the region and in the world, as well as increasing the counterparts' capacity on food safety. The Matching Grants Manual incorporates all the features that have allowed for successful implementation of other grants programs. Further, procedures will be reviewed and revised after each call for proposals and specific lessons from implementation will be incorporated into the manual. Experience under IDP is reflected in the steps for selection of irrigation schemes to be supported by the project, in the selection criteria, and



assessment of readiness.

111. Institutional Capacity for Implementation and Sustainability risk is considered substantial. Based on the experience of the recent completed IDP project, there are three main risks which could substantially delay implementation progress and the sustainability of the service post project completion. First, financial resources to maintain and operate existing irrigation and drainage assets or develop new infrastructure is limited. Though drainage and irrigation service fees are mentioned in the law, they are often not collected, requiring subsidies from the entities, cantons and municipalities. This could pose significant fiscal burden for entities, municipalities or cantons. Second, there are complex permit and approval procedures involving multiple entities, which need to be completed prior to the commencement of the actual construction. Finally, implementation progress may suffer due to lack of formal participation of the municipalities/cantons in the project. To mitigate these risks, the project will build capacities of participating institutions for management and O&M of the systems. Further it will conduct citizen engagement activities to sensitize and get buy-in from relevant stakeholders prior to the selection of investments.

112. Fiduciary risk is rated moderate. While the PIU/APCU have experience with the Bank's financial management requirements and procurement procedures, there are risks associated with the magnitude and scope of the project. Some of the mitigation measures will include confirmation of the FM staffing, preparation of the FM sections for the POM, preparation of the Matching Grants Manual and regular project reporting and auditing. To mitigate the risks identified earlier, the PIU/APCU may be supported by individual consultants, as necessary, who will provide technical and fiduciary support for procurement of information technology goods, selection of consultants and contracts management. No major civil works are expected to be financed under the project.

113. Environment and Social risks are rated substantial. It is anticipated these risks will be largely mitigated and managed through adequate due diligence documents prepared prior to appraisal and by screening out associated high risk activities. This includes risks triggering OP 7.50 on International Waterways. Impacts on cultural heritage or protected areas will be screened out through the said due diligence. Main social risks are associated with potential permanent land acquisition, grants and vulnerable groups in the context of the project, labor issues and potential breaches of labor rights, and inadequate OHS for workers of matching -grant recipients. The GBV risks associated with the project are low but will be mitigated by a GRM and Contractor's Code of Conduct.

114. Stakeholder risk is considered moderate. This risk is assessed as moderate given the strong and demonstrated interest by the various institutions to be supported by the project to the project activities. In addition, Municipalities/Cantons that will receive investment in irrigation development and rehabilitation, and beneficiaries of the matching grants schemes have demonstrated interest and commitment to project activities by their willingness to co-finance the investments.

115. Other Risks include institutions' willingness to implement unified system, which is considered moderate. The project will support the enhancement of Information Technology systems for increasing the transparency of support to the agriculture sector and improving compliance to Food Safety Standards. As experienced in previous operations, there is the risk that the entities will not ensure unification of the system to avoid information sharing. To mitigate this risk, the project will ensure compatibility of the systems, along with compliance with EU requirements, while unification of the system and sharing of information would not be made a condition for implementation of project activities.



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Bosnia and Herzegovina

Agriculture Resilience and Competitiveness Project

Project Development Objectives(s)

The Project Development Objective is to increase climate resilience and competitiveness of the agriculture sector.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Increase agriculture sector climate resilience			
Farmers adopting improved agricultural technology (CRI, Number)		0.00	3,000.00
Farmers adopting improved agricultural technology - Female (CRI, Number)		0.00	1,000.00
Farmers adopting improved agricultural technology - male (CRI, Number)		0.00	2,000.00
Farmers with access to irrigation/drainage services supported by the project (Number)		0.00	10,000.00
Increase competitiveness			
Percentage of aggregators supported by the project reporting increases in sales (Percentage)		0.00	50.00



Indicator Name	PBC	Baseline	End Target
Increase in percentage of improved risk-based official controls by the veterinary, food safety and plant health sectors (Percentage)		10.00	50.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	End Target
Component 1: Enhancing public support resilience and traceability			
Improved farm and client registry (Yes/No)		No	Yes
New registers for priority value chains established (Yes/No)		No	Yes
Share of agriculture support programs implemented through upgraded Payment systems (Percentage)		0.00	70.00
Farm Accountancy Data Network (FADN) established (Yes/No)		No	Yes
Increased number of seeds and seedling varieties registered (Number)		0.00	5.00
Extension staff trained in climate smart production practices and/or technologies (Number)		0.00	150.00
Extension staff trained in climate smart production practices and/or technologies - Female (Number)		0.00	45.00
Client days of training provided for extension staff (Number)		0.00	3,000.00
Improved access to local climate information services with digital information platforms (Yes/No)		No	Yes
Component 2: Improving agriculture productivity, adaptation to climate change, and enhancing linkage			
Farmers reached with agricultural assets or services (CRI, Number)		0.00	2,000.00
Farmers reached with agricultural assets or services - Female		0.00	600.00



Indicator Name	PBC	Baseline	End Target
(CRI, Number)			
Sales of agricultural produce from farmers supported by the aggregators (Metric ton)		0.00	25,000.00
Sub-projects financed by the project (Number)		0.00	50.00
Matching grant information and awareness campaigns targeting women (Number)		0.00	10.00
Area provided with new/improved irrigation or drainage services (CRI, Hectare(Ha))		0.00	5,500.00
Area provided with new irrigation or drainage services (CRI, Hectare(Ha))		0.00	5,000.00
Area provided with improved irrigation or drainage services (CRI, Hectare(Ha))		0.00	500.00
Number of end-user O&M agreements signed and adopted (Number)		0.00	14.00
Increase in irrigation efficiency (Percentage)		0.00	15.00
Component 3: Enhancing Food Quality and Safety			
Number of officially designated veterinary, food safety and plant health laboratories upgraded (Number)		0.00	10.00
IT Systems for veterinary, food safety and plant health fully adopted and implemented, with long-term maintenance plan in place (Number)		0.00	3.00
Number of official veterinary, food safety and plant health staff using the sectoral IT systems (Number)		0.00	200.00
Number of official veterinary, food safety and plant health staff using the sectoral IT systems - Female (Number)		0.00	60.00
Component 4: Project Management			
Citizen Engagement – Direct Beneficiaries that report project investments reflected their needs and provide feedback (Percentage)		0.00	80.00



Indicator Name	PBC	Baseline	End Target
Grievances responded and/or resolved within 90 days (Percentage)		0.00	80.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Farmers adopting improved agricultural technology	<p>This indicator measures the number of farmers (of agricultural products) who have adopted an improved agricultural technology promoted by operations supported by the World Bank.</p> <p>NB: "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber and non-timber forest products.</p> <p>Adoption refers to a change of practice or change in use of a technology that was</p>	Semi-annual	Project's M&E system	Project's progress reports. In this case the indicator will measure in particular adopting climate smart technology.	RS APCU, FBiH PIU, BiH MoFTER



	<p>introduced or promoted by the project.</p> <p>Technology includes a change in practices compared to currently used practices or technologies (seed preparation, planting time, feeding schedule, feeding ingredients, postharvest storage/processing, etc.). If the project introduces or promotes a technology package in which the benefit depends on the application of the entire package (e.g., a combination of inputs such as a new variety and advice on agronomic practices such as soil preparation, changes in seeding time, fertilizer schedule, plant protection, etc.), this counts as one technology.</p> <p>Farmers are people engaged in farming of agricultural products or members of an agriculture related business (disaggregated by men and women) targeted by the project.</p>				
--	---	--	--	--	--



Farmers adopting improved agricultural technology - Female		Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Farmers adopting improved agricultural technology - male		Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Farmers with access to irrigation/drainage services supported by the project	This indicator measures the number of farmers with access to irrigation/drainage services through the irrigation/drainage rehabilitation, modernization and development activities financed by the project.	Semi-annual	Project's M&E system	Project's progress reports. Number and demographics of farmers will be collected in each irrigation/drainage scheme development area.	RS APCU, FBiH PIU, BiH MoFTER
Percentage of aggregators supported by the project reporting increases in sales	This indicator measures increased competitiveness of agri-food companies and local production on domestic and export markets through sales growth including volumes and/or value added.	Annual	Project's M&E system	Project's progress reports. Baseline and end-target surveys will be conducted to collect data and measure the performance of supported aggregators as well as non-beneficiaries. Analysis and comparison of outcomes between project beneficiaries and non-beneficiaries will be conducted to identify the project impacts.	RS APCU, FBiH PIU, BiH MoFTER



Increase in percentage of improved risk-based official controls by the veterinary, food safety and plant health sectors	This indicator measures the increase in percentage of improved risk-based official controls by the veterinary, food safety and plant health sectors.	Annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
---	--	--------	----------------------	----------------------------	-------------------------------

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Improved farm and client registry	This indicator measures whether the overall farm and client registry be improved, which will include updates in terms of hardware and software and connection with other registers, either currently existing or to be developed under the project for priority value chains and other registers.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
New registers for priority value chains established	Establishment of priority new registers.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Share of agriculture support programs implemented through upgraded Payment systems	This indicator measures the usage of payment system online applications instead of paper applications for the agriculture support	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	programs implementation.				
Farm Accountancy Data Network (FADN) established	Establishment of the Farm Accountancy Data Network (FADN) to improve information collection and data use for policy analysis.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Increased number of seeds and seedling varieties registered	This indicator measures the improvement of seed quality and production, including improvement of local varieties to be better adapted to climate change (e.g. drought-resistant, heat tolerant and flood tolerant) in RS.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, BiH MoFTER
Extension staff trained in climate smart production practices and/or technologies	This indicator measures the number of extension staff trained through at least one training session on improving extension service delivery of climate smart production practices and/or technologies.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Extension staff trained in climate smart production practices and/or technologies - Female		Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Client days of training provided for extension staff	This indicator aggregates the number of client days of training provided for extension staff during the project period.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



Improved access to local climate information services with digital information platforms	This indicator measures the improvement of access to local climate information services enabled by the digital information platforms by measuring the numbers of access to the platforms.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Farmers reached with agricultural assets or services	This indicator measures the number of farmers who were provided with agricultural assets or services as a result of World Bank project support. "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber, and non-timber forest products. Assets include property, biological assets, and farm and processing equipment. Biological assets may include animal agriculture breeds (e.g., livestock, fisheries) and genetic material of livestock, crops, trees, and shrubs (including fiber and fuel crops). Services include research, extension, training,	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	education, ICTs, inputs (e.g., fertilizers, pesticides, labor), production-related services (e.g., soil testing, animal health/veterinary services), phyto-sanitary and food safety services, agricultural marketing support services (e.g., price monitoring, export promotion), access to farm and post-harvest machinery and storage facilities, employment, irrigation and drainage, and finance. Farmers are people engaged in agricultural activities or members of an agriculture-related business (disaggregated by men and women) targeted by the project.				
Farmers reached with agricultural assets or services - Female		Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Sales of agricultural produce from farmers supported by the aggregators	This indicator measures the volume of sales (tons) of agricultural produce from farmers supported by the aggregators.	Annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Sub-projects financed by the project	This indicator measures the number of sub-projects financed through the	Annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	matching grants provided by the Project.				
Matching grant information and awareness campaigns targeting women	This indicator measures the number of matching grant information and awareness campaigns carried out specifically for potential women beneficiaries.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Area provided with new/improved irrigation or drainage services	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Monthly	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Area provided with new irrigation or drainage services	Measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World Bank.	Monthly	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Area provided with improved irrigation or drainage services	Measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World	Monthly	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	Bank.				
Number of end-user O&M agreements signed and adopted	This indicator measures the development of O&M arrangements by facilitating signing tripartite O&M agreements among the end beneficiaries/WUA, the ministry/canton (assets owner), and the municipality/utility (i.e. the O&M service provider), to ensure the sustainability of introduced off-farm infrastructure/facilities.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Increase in irrigation efficiency	This indicator measures the increase in irrigation efficiency realized by the reduction of conveyance losses. Values and targets refer to efficiency increase, in absolute percentage points from baseline, averaged over project schemes.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Number of officially designated veterinary, food safety and plant health laboratories upgraded	This indicator aggregates the number of officially designated veterinary, food safety and plant health laboratories that will be upgraded through the provision of specific	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	laboratory equipment etc..				
IT Systems for veterinary, food safety and plant health fully adopted and implemented, with long-term maintenance plan in place	This indicator aggregates the number of IT systems developed and upgraded for improving critical for real-time documentation control activities on food and feed safety, veterinary and plant health.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Number of official veterinary, food safety and plant health staff using the sectoral IT systems	This indicator aggregates the number of staff from the veterinary, food safety and plant health sectors who will be trained to use the IT systems to implement and practice the food safety, veterinary and plant health standards.	Annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Number of official veterinary, food safety and plant health staff using the sectoral IT systems - Female	A target of 50 percent of female staff from veterinary, food safety and plant health will be trained to use the IT systems.	Annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER
Citizen Engagement – Direct Beneficiaries that report project investments reflected their needs and provide feedback	This indicator measures the percentage of project beneficiaries that provide a feedback including through scorecards, to generate recommendations on how to strengthen participation based on gender	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



	representation of direct beneficiaries and other stakeholders, and how to strengthen implementation throughout the project's lifetime.				
Grievances responded and/or resolved within 90 days	This indicator measures the implementation of grievance redress mechanisms by the percentage of total received grievances be responded and/or resolved within 90 days.	Semi-annual	Project's M&E system	Project's progress reports	RS APCU, FBiH PIU, BiH MoFTER



ANNEX 1: Implementation Arrangements and Support Plan

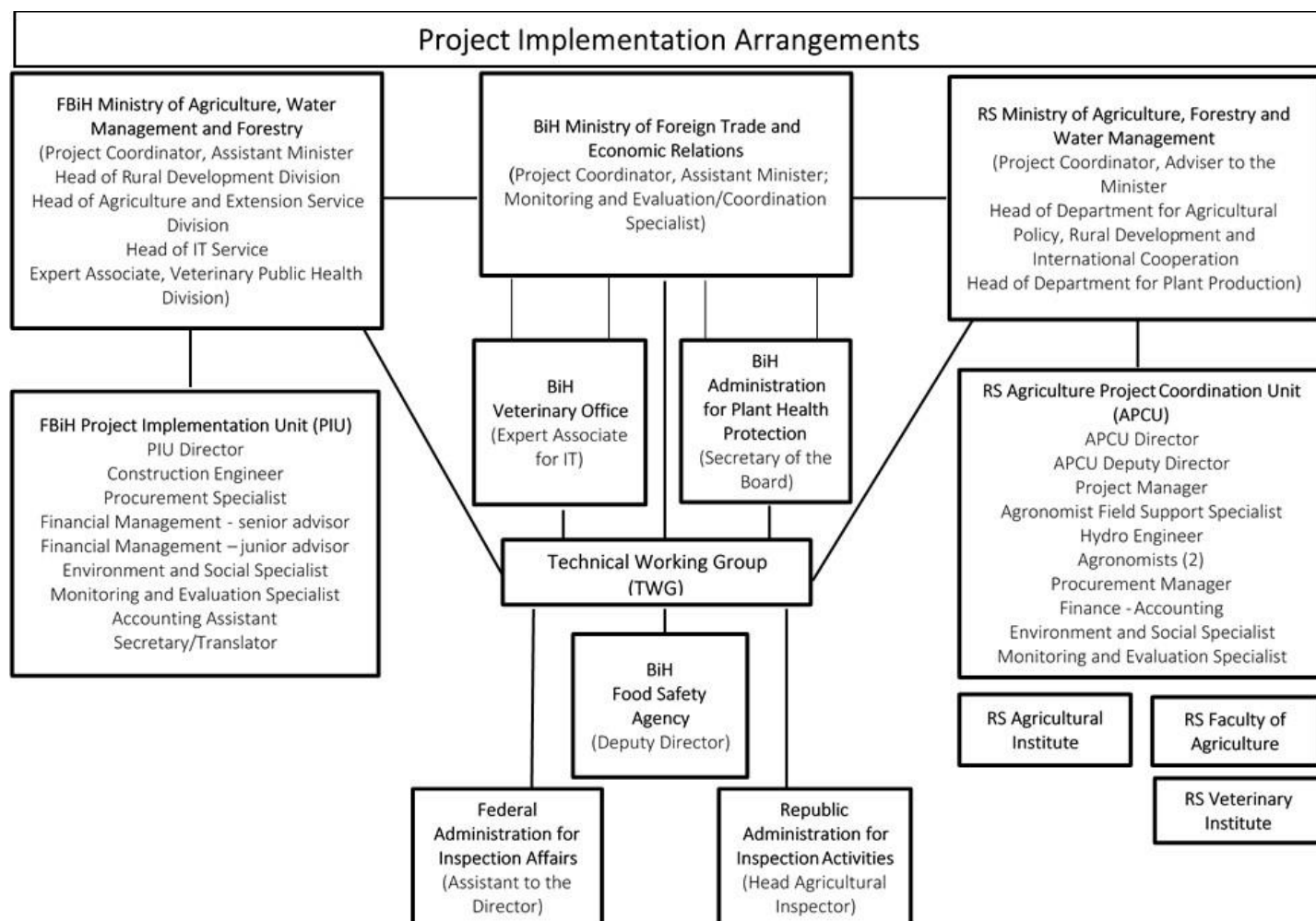
COUNTRY: Bosnia and Herzegovina Agriculture Resilience and Competitiveness Project

Project Institutional and Implementation Arrangements

1. The immediate and day-to-day responsibility for project coordination and administration support will be performed by the Ministry Foreign Trade and Economic Relations (MoFTER), the FBiH Ministry of Agriculture, Water Management and Forestry (FBiH MoAWMF) and the RS Ministry of Agriculture, Forestry and Water Management (RS MoAFWM).
2. The MoFTER will be responsible for overall project monitoring and reporting jointly with project implementing entities. The MoFTER will compile semi-annual progress reports (based on entities' semi-annual reports), including the monitoring framework, and submit them to the Bank. A Project Coordinator (at the level of Assistant Minister or a Head of Unit), has been appointed and will be responsible for coordination within MoFTER. The MoFTER will also include at minimum, a Monitoring and Evaluation/Coordination Specialist as MoFTER will be responsible for compiling of entity reports, including monitoring and evaluation.
3. The main responsibility for implementation will be with the FBiH MoAWMF and the RS MoAFWM and their respective implementation units - FBiH Project Implementation Unit (PIU) and RS Agriculture Project Coordination Unit (APCU). These Ministries have a good record of implementing projects financed by the Bank, such as ARDP, IDP, and other externally financed agriculture sector projects. A Project Coordinator (at the level of Assistant Minister or a Head of Unit) has been appointed and will be responsible for overall coordination at entity level and within their Ministry and implementation unit and will report to the entity Government for project implementation. The Ministries have both well-functioning and experienced project implementation units – the APCU in RS, and the PIU in FBiH. Both have served as the focal units for the preparation and implementation of agriculture and irrigation projects. The APCU and PIU structure will comprise of Project Manager, Procurement Manager, Financial Manager, Monitoring and Evaluation Specialist and Environmental and Social Specialist for overall project management and oversight, including fiduciary, environmental and social aspects, monitoring and evaluation. The current structures already include professional staff for agriculture and water management that will be retained for the implementation of ARCP. Due to the requirement of application of the Environmental Safeguards Framework (ESF), the units will benefit from additional capacity building and external support of qualified and experienced environmental and social development consultants. Furthermore, the project may support additional technical capacity required for the implementation of the proposed project. A joint Technical Working Group (TWG) has been established to provide technical guidance and coordination of the various project activities during the project implementation. It comprises of the following existing counterpart institutions/agencies which will be responsible for implementation of project activities: MoFTER with the Veterinary Office of Bosnia and Herzegovina (VOBiH) and the Administration for Plant Health Protection (APHP), the Food Safety Agency (FSA), FBiH MoAWMF, FBiH Inspectorate, RS MoAFWM and RS Inspectorate. These counterpart agencies or institutions will be responsible for preparation of terms of reference and technical specifications, preparation of training programs, supervision of consultants and advisors, among other. The TWG will be led by MoFTER and it is estimated that it will meet every quarter or on as needed basis during the first two years of project implementation and less frequent thereafter. Participation to the TWG may be extended to project stakeholders and beneficiaries including representatives of cantons and



municipalities, WUAs, farmers organization, processors, research institutions, etc. according to the topics to be addressed in the meetings.





Financial Management

Planning and budgeting

4. In the PIU, there are adequate planning arrangements and it is done for each project. Actual versus planned data is compared and any variances are explained.
5. The APCU prepares annual plans based on detailed procurement planning. Existing FM staff in the PIU and APCU have adequate capacity for planning and budgeting in terms of human resources, availability of quality information and IT system. The PIU and APCU prepare budgets for all project components for each entity separately. The budgets are entered in the accounting software and actual versus planned information analyzed and explained. Budgeting and accounting in both PIU and APCU is appropriate.
6. **Accounting policies and procedures.** The PIU and APCU have acceptable project accounting software for the project implementation arrangements. The software has the necessary features to produce the required reports and maintain a trail of transactions in verifiable manner. The PIU and APCU will maintain project accounts and will ensure appropriate accounting of the funds provided.
7. Additional accounting policies applied to the project adhere to the following principles: (i) Cash accounting as the basis for recording transactions, (ii) Reporting in the currency of the loan and (iii) Quarterly IFRs prepared.
8. **Staffing.** The PIU and APCU have a fully functional accounting and finance department. Both units have experience in implementing several World Bank-funded projects such as the Irrigation Development Project (Project P115954) and the Drina Flood Protection Project (P143844).
9. **Financial Management Manual.** The PIU and APCU have acceptable financial management manuals (FMM) for the WB-funded projects which need to be updated for the purpose for this project. The manuals contain details about the accounting procedures applicable, internal key controls performed (i.e. reconciliations, authorizing procedures), budgeting, fixed assets records, details pertaining to the accounting software (i.e. back up procedures, restricted access, transaction recording). The FMMs are being regularly updated.
10. **Back up.** In the PIU back-up of project accounting data is done on a regular basis (weekly and daily) and it is stored on servers, FM manager's PCs, and/or removable drives. The removable memory drives are stored in FBiH PIU premises.
11. In the APCU the back-up is done on the APCU server on a daily basis. In addition to the back-up saved on server, the RS APCU should make regular back-ups on CDs or USB drives.
12. **Internal Controls and Internal Audit.** The PIU and APCU will maintain adequate internal controls for the project, including regular reconciliation of bank accounts, adequate segregation of duties, proper accounting policies and procedures and monthly reconciliation of disbursement summaries with accounting records will be performed. Designated Accounts reconciliation statements, Client Connection figures will be reconciled monthly with the accounting records. IFRs would be reconciled on a regular basis with the accounting data. The IFRs will be reconciled on a regular basis with the trial balance out of which they are prepared, including the relevant bank statements. Evidence of the reconciliation made will be kept in project records. The PIU and APCU will maintain, print and store all back up documentation (trial balance, bank statements, journal entries etc.) for the quarterly IFRs in a file. Further details on the internal controls will be contained in the FMMs.



13. Internal audit departments exist in both Ministries however both are in an early stage of development and thus reliance on their work for the project will be assessed for each implementation support and supervision mission separately.
14. **FM Reporting and Monitoring Arrangements.** The PIU and APCU shall prepare and furnish to the Bank not later than forty-five (45) days after the end of each calendar quarter, IFRs for the project covering the quarter, in form and substance satisfactory to the Bank. The IFRs will include sources and uses of funds, uses of funds by project activity, Statement of financial position, designated account (DA) reconciliation Statement. The formats of the IFRs have been agreed and confirmed.
15. **External Audit.** The PIU and APCU will be responsible for the timely compilation of annual project financial statements for the independent external audit. Project financial statements (including SOE and DA activities) will be audited by an independent auditor acceptable to the Bank and contracted by the Ministry of Finance and Treasury of BiH. Each audit of financial statements will cover one fiscal year of the borrower, commencing with the fiscal year in which the first withdrawal is made under the loan. The scope of the project financial audit will be extended to include the audit of the ARCP matching grant scheme. In addition, the auditors are expected to deliver management recommendation letters in relation to the project, identifying any internal control deficiencies and accounting issues. The audit reports, audited financial statements and management recommendation letters, will be delivered to the Bank within six months after the end of each fiscal year. The audited project audited financial statements will be made publicly available in a timely fashion, and in a manner acceptable to the Bank.
16. There are no overdue reports for the projects funded from Bank-funds for the year ended 31 December 2019.
17. **Co-financing.** The project co-financing is envisaged for the categories of expenditure related to matching grants. Such co-financing will be secured by the grants beneficiaries as defined in the Matching Grants Manual. In addition, for the financing of irrigation works under Part A.2(b) and B.2(b) the funds will be provided out of 2 sources of funding namely the IBRD loan and municipalities counterpart funding. Works will be co-financed by the Municipalities up to 15% as specified in the Project Operational Manual (POM). Therefore, part of the funds will flow from the DA to suppliers and the amounts required for counterpart contribution will flow from municipalities to the local currency project account and from there will be channeled to suppliers.
18. **Disbursements and flow of funds.** Disbursements will be carried out in line with the *Disbursement Guidelines for Investment Project Financing* (dated February 2017). Two separate DAs will be opened by the Ministry of Finance and Treasury of BiH namely, DA A for Category (1), Category (2) and Category (3) for the F BiH, and DA B for Category (4), Category (5) and Category (6) for RS. The IBRD DAs will be denominated in the currency of the loan as selected by the borrower (EUR) and will be opened in a financial institution acceptable to the Bank. The disbursement methods made available are direct payments, reimbursements, and advances. The ceiling of the designated accounts and the minimum value of applications for direct payments and reimbursements will be defined in detail in the Disbursement and Financial Information Letter. The eligible expenditures will be documented using SOE only, or invoices in case of direct payments. Withdrawal applications for the replenishments of the DAs will be sent to the Bank on a monthly basis.
19. Supporting documents for SOEs, including completion reports and certificates, will be retained by the PIU and APCU and made available to the Bank during project supervision.
20. The funds will flow from the DAs directly to the suppliers, or if direct payments are used directly from the loan account to the suppliers.



21. **Disbursement allocations.** The amount of EUR 30.7 million will be allocated to the FBiH and RS as indicated in the tables below. This table sets forth the eligible expenditures to be financed out of the proceeds of the loan, the allocation of the amounts of the loan to each category, and the percentage of eligible expenditure to be financed for each category.

Table 1: Disbursement Allocations

Category	Amount of the Loan Allocated (expressed in EUR)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consulting services, Training and Operating Costs for Part A of the Project, except Parts A.1 (c), 3 (c) and 4 (b).	26,797,250	100%
(2) Goods, works, non-consulting services, consulting services, Training and Operating Costs for Part A.1 (c), 3 (c) and 4 (b) of the Project.	1,576,000	100%
(3) Matching Grants under Part A.2(a) of the Project	2,250,000	100% of the disbursed amount
(4) Goods, works, non-consulting services, consulting services, Training and Operating Costs for Part B of the Project, except Parts B.1 (c), 3 (b) and 4 (b).	25,297,250	100%
(5) Goods, works, non-consulting services, consulting services, Training and Operating Costs for Parts B.1 (c), 3 (b) and 4 (b) of the Project	1,576,000	100%
(6) Matching Grants under Part B.2(a) of the Project	3,750,000	100% of the disbursed amount
(7) Front-end Fee	153,500	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
(8) Interest Rate Cap or Interest Rate Collar premium	0	Amount due pursuant to Section 4.05 (c) of the General Conditions
TOTAL AMOUNT	61,400,000	

22. **Financial Management Action plan, Conditions and Covenants.** The PIU and APCU will continue to maintain a project financial management system acceptable to the Bank. The project financial statements will be audited by independent auditors acceptable to the Bank and on terms of reference acceptable to the Bank. The annual audited statements and audit report will be provided to the Bank within six months of the end of each fiscal year. Quarterly IFRs will be forwarded to the Bank no later than 45 days after the end of each quarter. There is an action plan with dated actions and dated covenants as follows:



Action	Deadline	Responsibility
(a) confirming FM staffing arrangements.	Prior to negotiations	PIU and APCU
(b) revising FM sections of the POM	Dated actions, not later than 1 month after effectiveness	PIU and APCU
(c) renewal of FM software license	Implementation action	PIU and APCU
(d) preparation of the Matching Grants Manual.	Disbursement condition for category 2 and 4	PIU and APCU

23. **Use of country systems.** No specific country systems are available for this project. So far available country systems will be considered for application in this project.

24. **Contract management.** In the PIU and APCU there will be a technical and financial database established for all project contracts. The technical database is updated by procurement staff on a regular basis. Such database has all information on contracts, any annexes which were concluded as well as any payments made. The FM managers have an overview over the payments and can easily control and prevent any overpayments.

25. **Supervision Plan.** As part of its project supervision, the Bank will conduct risk-based financial management supervisions, at appropriate intervals, in the following ways: (a) review the project's quarterly financial reports, the project's annual audited financial statements, the auditor's management letter and remedial actions, if any; and (b) during the Bank's on-site supervision missions, review the following key areas (i) project accounting and internal control systems; (ii) budgeting and financial planning arrangements; (iii) disbursement management and financial flows, including counterpart funds, as applicable; and (iv) any incidences of corrupt practices involving project resources.

Procurement

Project Procurement Strategy Document

26. Project Procurement Strategies for Development (PPSDs) have been prepared by each entity, to outline the selection methods to be followed during project implementation in the procurement of goods, works, and non-consulting and consulting services financed by the Bank. The underlying Procurement Plan for each entity will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The identified risks and the mitigation measures are detailed in the PSDs.

27. Procurement under the project will be subject to the World Bank's Procurement Framework. All procurement will be conducted through the procedures as specified in the World Bank's Procurement Regulations for IPF Borrowers: Procurement in Investment Project Financing Goods, Works, Non-Consulting, and Consulting Services, July 2016 (revised November 2017, August 2018, and November 2020) (Procurement Regulations). The project will also be subject to the World Bank's Anticorruption Guidelines, dated July 1, 2016.

28. The PIUs in each entity will use the Systematic Tracking of Exchanges in Procurement (STEP) system. STEP is a planning and tracking system, which would provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance. Based on procurement capacity assessment conducted for the PIUs in charge with project implementation in respective entities, it was determined that the procurement risk is "moderate".

29. The project will be implemented by the ministries and/or government/implementing agencies responsible for



agriculture. Where applicable, PIUs shall comprise of at least the following key staff: a PIU head, a FM specialist, and a procurement specialist, and will be complemented by technical staff from the ministries.

30. Regarding implementation arrangements: (i) in FBiH, the existing PIU within FBiH MoAWMF will be in charge of fiduciary arrangements for the part of the project implemented in the Federation of BiH; (ii) in RS, the existing PIU (APCU) established within RS MoAFWM will be in charge of fiduciary arrangements for part of the project implemented in RS. Both FBiH PIU and APCU possess more than 10 years of experience in implementing World Bank-financed projects and are sufficiently staffed with knowledgeable procurement professionals.

Procurement Arrangements

Procurement of Works

31. Works eligible under the project will be procured under open procedure, both National and International, using procedures and methods (Request for Bids) specified in more detail in the Procurement Plan, depending on their estimated cost value. The threshold for prior review and procurement methods are set forth in the PPSDs.

32. For FBiH, the civil works activities include development of new and rehabilitation/modernization of existing irrigation and drainage systems. The scale of civil works is relatively small ranging from EUR 255,000 to about EUR 1.2 million; and there are many national or local contractors that have the capacity to execute such kind of works as demonstrated by the PSD. RFQ method may be envisaged for contracts less than USD 200,000 and RFB method will be used for contracts of equivalent or above USD 200,000, using national market approach up to USD 5 million.

Procurement of Consulting Services

33. Consulting services under the project are of varying size and complexity. Selection of consulting firms will be done using the World Bank standard procurement documents, such as Request for Proposals. The employment of an individual expert will be conducted through the selection of ICs in accordance with the Procurement Regulations. In case the service is required from a consultancy firm, the Quality- and Cost-based Selection (QCBS) method will be applied and other methods such as Least-Cost Selection (LCS), Fixed Budget Selection (FBS), or Quality-Based Selection (QBS) may also be used following provisions of Procurement Regulations. For contracts below USD 300,000 equivalent, the Selection Based on Consultants' Qualification (CQS) method may be used.

34. For FBiH, the consulting services under the project comprises of (i) consulting services related to construction irrigation (feasibility studies, ESMP preparation and design and supervision of irrigation/drainage works); (ii) several firm consulting assignments such as project development and implementation of disaster recovery plan, mid-term review and final survey of the project; and (iii) various assignments for individual consultant such as IT experts for the need of entity and BiH institutions, technical assistance (TA) for development of terms of references (ToRs), construction engineers and existing PIU staff with cost estimate ranging from EUR 3,000 to EUR 200,000. Market research has shown that there are sufficient national consulting firms and individuals having the required qualifications and experience to provide such type of consulting services. It hence suggests that CQS and competitive selection method should be used respectively for firm assignment and individual assignment, with national market approach up to USD 300,000. International market approach should also be considered for the contracts that need international experience and where international consultants would be beneficial to the project implementation. In addition, based on the PSD the QCBS method is encouraged to be used for relatively large contracts such as contracts with cost estimate of equivalent or above USD 300,000.



Procurement of Goods and Non-Consulting Services

35. Goods may be procured using procedures and methods (Request for Bids, Request for Quotations, and Direct Selection) specified in more detail in the Procurement Plan, depending on their estimated cost value. The threshold for prior review and procurement methods are set forth in the PPSDs.

36. For FBiH, the procurement of goods comprises of various Information Systems, hardware and software procurement, laboratory equipment, vehicles, office equipment and furniture, which are of relatively simple nature and small size of value. Market research has shown that there are a sufficient number of potential suppliers in the country that have the capacity to supply this type of goods. Therefore, it proposes to use RFB method for the contracts with cost of equivalent or above USD 100,000 or RFQ method for the contracts with cost below USD 100,000 with national market approach for contract up to USD 1 million, except for the procurement of laboratory equipment which will be advertised internationally.

General Procurement Notice

37. The General Procurement Notice will be prepared and submitted to the World Bank before effectiveness. The World Bank will arrange for its publication in United Nations Development Business online and on the World Bank's external website. The General Procurement Notice will contain information concerning the borrowers, amount, and purpose of the loan; scope of procurement reflecting the Procurement Plan; the name, telephone (or fax) number, and address(es) of the borrower's agencies responsible for procurement; and the address of a widely used electronic portal with free national and international access or website where the subsequent Specific Procurement Notices will be posted. The General Procurement Notice will be published tentatively in late-2021 providing information on the scope of major procurements for the project and soliciting expressions of interest from prospective bidders and/or consultants for this project.

Procurement Plan

38. The entities have developed their respective initial Procurement Plans for the entire project consistent with the implementation plan, which provide information on the procurement of packages, potential selection processes with methods, and the World Bank review requirements. Since this will cover the entire project completion period, it will be tentative. However, a Procurement Plan(s) per entity for the first 12 months of the project should be prepared in more detail. The Procurement Plan(s) will be updated in agreement with the World Bank project team at least annually or as required to reflect the actual project implementation needs and improvements in the PIU's institutional capacity. The recommended Procurement Plan(s) for the project is given below (Table 2).

Table 2: Potential Procurement Packages

Item	Description	Type	Selection Method	Review	Implementing Agency
Component 1: Improvement of Resilience and Traceability of Public Support					
Subcomponent 1.1: Improvement of Agriculture Information System					
Federation of Bosnia and Herzegovina					
1.1.1.1.	Upgrade of Beekeepers Register and Connection to other Institutions	G	RFB	Post	FBiH PIU
1.1.1.2	Development of Vineyards and Wine Producers Register	G	RFB	Post	FBiH PIU



1.1.1.3	Upgrade of Payment Process Application (PPA) and Farmer portal	G	RFB	Post	FBiH PIU
1.1.1.4	Procurement of IT Equipment for Agriculture Farm Register	G	RFB	Post	FBiH PIU
1.1.1.5	IT Consultant	CS	IC	Post	FBiH PIU
1.1.2.1	Development of IS for Livestock breeding and selection activities	G	RFB	Post	FBiH PIU
1.1.2.2	Procurement of various IT equipment for laboratories	G	RFQ	Post	FBiH PIU
1.1.2.3	IT Consultant	CS	IC	Post	FBiH PIU
1.1.3.1	Development of application for all other registers	G	RFB	Post	FBiH PIU
1.1.3.2	IT Consultant	CS	IC	Post	FBiH PIU
1.1.4.1	Development of Application for Cantonal Payment Processing	G	RFB	Post	FBiH PIU
1.1.4.2	IT Equipment for Cantons	G	RFQ	Post	FBiH PIU
1.1.4.3	IT Consultant	CS	IC	Post	FBiH PIU
1.1.5.1	Procurement of HW Equipment for Data Center in Butmir and Ministry Including Licenses	G	RFB	Post	FBiH PIU
1.1.6.1	Development, implementation and testing of Disaster Recovery Plan	CS	CQS	Post	FBiH PIU
1.1.6.2	Procurement of Server and Network Equipment for DR site with Licenses	G	RFB	Post	FBiH PIU
1.1.7.1	Vehicle for the activities from Component 1	G	RFQ	Post	FBiH PIU
1.1.7.2	Office furniture	G	RFQ	Post	FBiH PIU
Republika Srpska					
1.1.1	IT Consultants (2)	CS	IC	Post	RS APCU
1.1.2	TA for preparation of TS for upgrading the FCR	CS	CQS	Post	RS APCU
1.1.3	Upgrade of FCR	G	RFB	Post	RS APCU
1.1.5	Implementation of LPIS pilot	G	RFB	Post	RS APCU
1.1.6	TA for preparation of TS for developing and implementing Agricultural Payment System	CS	CQS	Post	RS APCU
1.1.7	Implementation of Agricultural Payment system	G	RFB	Post	RS APCU
1.1.8	TA for preparation of TS for developing and implementing Business Intelligence System	CS	CQS	Post	RS APCU
1.1.9	Implementation of Business Intelligence System	CS	QCBS	Post	RS APCU
1.1.10	TA for preparation of TS for developing and implementing of Phytosanitary GIS	CS	CQS	Post	RS APCU
1.1.11	Implementation of Phytosanitary GIS	G	RFB	Post	RS APCU
1.1.12	TA for preparation of TS for developing and implementing of system for precision agriculture	CS	CQS	Post	RS APCU
1.1.13	Implementation of system for precision agriculture	G	RFB	Post	RS APCU
1.1.14	Upgrade of ZIS/GIS ETFARM - Phase 1	G	RFB	Post	RS APCU
1.1.15	Upgrade of ZIS/GIS ETFARM - Phase 2	G	RFB	Post	RS APCU
BiH MoFTER					
1.1.16	IT Consultant	CS	IC	Post	RS APCU
1.1.17	Design/Supervision for the adaptation of the server room	CS	CQS	Post	RS APCU
1.1.20	IT Equipment	G	RFB	Post	RS APCU
1.1.21	Implementation of dissemination portal	G	RFB	Post	RS APCU
1.1.22	Implementation of FADN (multitenant solution)	G	RFB	Post	RS APCU
1.1.23	Upgrade of FCR	G	RFB	Post	RS APCU



1.1.24	Implementation of ISO 27001 standard	G	RFB	Post	RS APCU
Subcomponent 1.2: Supporting climate-resilient agriculture					
Federation of Bosnia and Herzegovina					
1.2.1.1	Implementation of tasks and activities defined by mid-term Work Program	G	TBD (Multi)	Post	FBiH PIU
1.2.1.2	Implementation of tasks and activities defined by mid-term Work Program	CS	TBD (Multi)	Post	FBiH PIU
1.2.1.3	TA for development of ToR for WEB portal design and for the design of the Application for the Registers	CS	IC	Post	FBiH PIU
1.2.1.4	Development, update and maintenance of Public agriculture extension service in FBiH WEB portal	G	RFB	Post	FBiH PIU
1.2.1.5	Application for keeping the Register of Agriculture Extension Service Providers and Register of Agriculture Extension Services	G	RFB	Post	FBiH PIU
1.2.1.6	Procurement of IT equipment (hardware, software) for Central (FMAWF) and cantonal agriculture extension services	G	RFB	Post	FBiH PIU
1.2.1.7	Procurement of IT equipment (hardware, software) town and municipal agriculture extension services	G	RFB	Post	FBiH PIU
1.2.1.8	Increase the mobility and functionality of Central and Cantonal Agriculture Extension Services (procurement of terrain vehicles– pick-up)	G	RFB	Post	FBiH PIU
1.2.1	Machinery for the Agricultural Institute & Agricultural Faculty	G	RFB	Post	RS APCU
1.2.2	Seed processing plant for the Agricultural Institute	G	RFB	Post	RS APCU
1.2.3	Construction works in the Agricultural Institute	W	RFB	Post	RS APCU
1.2.4	Office and field equipment for extension services	G	RFQ	Post	RS APCU
1.2.5	IT equipment and SW for extension services	G	RFQ	Post	RS APCU
1.2.6	Vehicles for Extension Services	G	RFQ	Post	RS APCU
Component 2: Improving the Agriculture Productivity, adapting to the Climate Changes and Improving the Market Links					
Subcomponent 2.1: Strengthening the Value Chains and Development of Productive Partnership					
Federation of Bosnia and Herzegovina					
2.1.1.1	Printing of promotional material for Grant program	G	RFQ	Post	FBiH PIU
2.1.1.2	Technical Assistance	CS	CQS/IC	Post	FBiH PIU
Republika Srpska					
2.1.1	Technical assistance	CS	QCBS	Post	RS APCU
2.1.2	Awareness campaign for grant program	CS	CQS	Post	RS APCU
2.1.3	Printing of promotional material for grant program	G	RFQ	Post	RS APCU
Subcomponent 2.2: Improving irrigation and drainage systems for climate change adaptation					
Federation of Bosnia and Herzegovina					
2.2.1.1	Construction works on irrigation system in Bihać	W	RFB	Post	FBiH PIU
2.2.1.2	Construction works on irrigation system in Sanski Most	W	RFB	Post	FBiH PIU
2.2.1.3	Construction works on irrigation system in Žepče	W	RFB	Post	FBiH PIU
2.2.1.4	Construction works on irrigation system in Živinice	W	RFB	Post	FBiH PIU
2.2.1.5	Supervision of works for above projects	CS	CQS (Multi)	Post	FBiH PIU
2.2.1.6.1	Construction works for new project schemes (15)	W	RFB (Multi)	Post	FBiH PIU
2.2.1.6.2	Feasibility studies and Detailed Design	CS	CQ/QCBS (Multi)	Post	FBiH PIU
2.2.1.6.3	ESMP Preparation	CS	CQS	Post	FBiH PIU



2.2.1.6.4	Supervision of works for new project schemes	CS	CQS/QCBS (Multi)	Post	FBiH PIU
2.2.1.6.5	TA for field work construction engineers	CS	IC (3)	Post	FBiH PIU
2.2.1.6.6	Connections to Electric Power Network	W	DC	Post	FBiH PIU
2.2.1.6.7	TA for institutional development of WUAs, utilities companies, etc.	CS	CQS/IC	Post	FBiH PIU
2.2.1.6.8	Office equipment	G	RFQ	Post	FBiH PIU
2.2.1.6.9	Development of Irrigation Information Management System (IIMS)	G	RFB	Post	FBiH PIU
2.2.1.6.10	Quality Monitoring of Water, Soil, etc.	CS	DC	Post	FBiH PIU
2.2.1.6.11	Development of database and financial module	CS	CQS	Post	FBiH PIU
Republika Srpska					
2.2.1	Feasibility studies	CS	CQS	Post	RS APCU
2.2.2	Safeguards documents	CS	CQS	Post	RS APCU
2.2.3	Drafting Main Design	CS	CQS/QCBS (Multi)	Post	RS APCU
2.2.4	Works	W	RFB (Multi)	Post	RS APCU
2.2.5	Supervision	CS	QCBS	Post	RS APCU
2.2.6	Technical Assistance institutional development	CS	IC	Post	RS APCU
2.2.7	GIS	G	RFB	Post	RS APCU
Component 3: Enhancing Food Quality and Safety					
Subcomponent 3.1: Food Quality and Safety Standards					
Federation of Bosnia and Herzegovina					
3.1.1.1	Procurement of Laboratory Equipment for FBiH Veterinary Service	G	RFB	Post	FBiH PIU
3.1.1.2	Procurement of Equipment for FBiH Agro-Mediterranean Institute	G	RFB	Post	FBiH PIU
3.1.1.3	Procurement of Vehicles for FBiH FAIA	G	RFB	Post	FBiH PIU
3.1.1.4	Procurement of Protective Equipment for Inspectors	G	RFB	Post	FBiH PIU
3.1.1.5	Procurement of Laboratory Equipment for Phytosanitary Inspection	G	RFB	Post	FBiH PIU
Republika Srpska					
3.1.1	Detailed design and bill of quantities for the prefabricated building for the Veterinary Institute	CS	CQS	Post	RS APCU
3.1.2	Construction - prefabricated building for the Veterinary Institute	W	RFB	Post	RS APCU
3.1.3	Supervision of construction works in the Veterinary Institute	CS	CQS	Post	RS APCU
3.1.4	Construction - new laboratory facility for the Agriculture Faculty	W	RFB	Post	RS APCU
3.1.6	Laboratory equipment for Agriculture Institute	G	RFB	Post	RS APCU
3.1.7	Laboratory equipment for Veterinary Institute	G	RFB	Post	RS APCU
3.1.8	Equipment for inspection services - vehicles	G	RFB	Post	RS APCU
3.1.9	Equipment for inspection services - office equipment	G	RFB	Post	RS APCU
Subcomponent 3.2: Information Technology (IT) Systems for Food Safety Enhancement					
Federation of Bosnia and Herzegovina					
3.2.1.1	Procurement of Hardware for FBiH Veterinary Service	G	RFB	Post	FBiH PIU
3.2.1.2	Procurement of Computer Equipment for the need of the FBiH Inspectorate	G	RFB	Post	FBiH PIU
3.2.1.3	Procurement of Software and Hardware Equipment for FAIA	G	RFB	Post	FBiH PIU
3.2.1.4	Procurement of Software and Hardware for Cantonal Inspectorates	G	RFB	Post	FBiH PIU



BiH Plant Health Administration					
3.2.2.1	Upgrade of Phytosanitary Information System	G	RFB	Post	FBiH PIU
3.2.2.2	Procurement of ICT Hardware	G	RFB	Post	FBiH PIU
3.2.2.3	IT Consultant	CS	IC	Post	FBiH PIU
BiH FSA					
3.2.3.1	Risk Assessment Module	G	RFB	Post	FBiH PIU
3.2.3.2	ICT Hardware	G	RFB	Post	FBiH PIU
3.2.3.3	IT Consultant	CS	IC	Post	FBiH PIU
BiH MoFTER/Veterinary Office					
3.2.1	TA to carry out a review of overall veterinary system and propose future developments	CS	CQS	Post	RS APCU
3.2.2	BIH VO Animal Identification Movement Control System	G	RFB	Post	RS APCU
3.2.3	BIH VO Data center	G	RFB	Post	RS APCU
3.2.4	BIH VO Official Control & Monitoring Report System	G	RFB	Post	RS APCU
3.2.5	BIH VO ICT Hardware	G	RFB	Post	RS APCU
Component 4: Project Management					
Federation of Bosnia and Herzegovina					
4.1.1	Small Office Equipment	G	RFQ	Post	FBiH PIU
4.1.2	PIU Staff and Technical Assistance	CS	DS/IC Multi	Post	FBiH PIU
Republika Srpska					
4.1.1	Project Manager	CS	DS	Post	RS APCU
4.1.2	Procurement Manager	CS	DS	Post	RS APCU
4.1.3	Support Specialist/ Monitoring and Evaluation	CS	DS	Post	RS APCU
4.1.4	Finance - Accounting	CS	DS	Post	RS APCU
4.1.5	Hydro Engineer (2 persons)	CS	DS	Post	RS APCU
4.1.6	Agronomist (hydromelioration) (2 persons)	CS	IC	Post	RS APCU
4.1.7	Environment and Social Specialist	CS	DS	Post	RS APCU
4.1.8	APCU Director (1/2 time)	CS	DS	Post	RS APCU
4.1.9	APCU Deputy Director (1/2 time)	CS	DS	Post	RS APCU
4.1.10	Mid-term review (survey)	CS	CQS	Post	RS APCU
4.1.11	Final study (survey)	CS	CQS	Post	RS APCU
4.1.12	Equipment (Computers, cars, other equipment)	G	RFQ/Various	Post	RS APCU
BiH MoFTER					
4.2.1	M&E/ Coordination Specialist	CS	IC	Post	RS APCU

Strategy and Approach for Implementation Support

39. The implementation support will focus on accomplishing the following objectives: (a) provide necessary technical advice to the client and bring international experiences and good practices to ensure that the project meets the Bank's technical standards; (b) ensure that the Implementing Agency's measures meet the standards approved by the Bank in terms of project supervision; and (c) ensure that the required fiduciary, social, and environmental safeguards are put in place and implemented per the Financing Agreement and other project documents.



40. Given the diversity of activities that the project supports, the Bank task team will require a corresponding range of skills covering general agriculture, agribusiness and value chain, water management and irrigation, IT systems, IT systems, food safety, veterinary and phytosanitary polices and services (Table 3).

41. The Bank team will review implementation progress at least 2 times a year, provide recommendations and guidance, and agree on the action plan/next steps. More frequent interaction will be carried out by the staff based in the region if needed.

42. **Procurement Supervision and Ex-post Review.** Routine procurement reviews and supervision will be provided by the procurement specialist based in the region. In addition, two supervision missions are expected to take place per year during the first year of implementation, and once every subsequent year during which ex-post reviews will be conducted for the contracts that are not subject to Bank prior review on a sample basis (20 percent in terms of number of contracts). One ex-post review report will be prepared per fiscal year, including findings of physical inspections for not less than 10 percent of the contracts awarded during the review period.

43. **Financial Management.** The Bank will supervise the project's financial management arrangements in two main ways, namely through: (a) reviewing the project's interim un-audited financial reports for each calendar quarter, as well as the project's and implementation entity's annual audited financial statements and auditor's management letter and (b) performing on-site supervision and reviewing the project's financial management and disbursement arrangements to ensure compliance with the Bank's minimum fiduciary requirements. The on-site supervision will include monitoring of agreed actions, review of randomly selected transactions, review of internal controls, and other specific supervision activities.

44. **Environmental and Social Implementation Support.** The Bank's Environmental and Social Specialist each will monitor the environmental and social performance of the project and the implementation of material measures and actions required under the Environmental and Social Commitment Plan (ESCP) including the timeframe for implementation of activities specified therein. The Environmental and Social Specialists will provide implementation support to the Borrower by reviewing information on implementation progress including implementation of the ESMF, RPF, LMP, SEP and any of the site-specific instrument developed to manage and mitigate the E&S risks of the project. The review will be complemented by providing guidance to the FBIH MoAWMF and the RS MoAFWM and their respective implementation units - FBIH PIU and RS APCU to ensure compliance with the Bank's Environmental and Social Framework and Operational Policies applicable to the project. Specific implementation support and guidance will be provided towards the eligibility assessment and E&S risk rating of locations and specific activities proposed by beneficiaries of the matching grants schemes. Even though both implementation Units have experience in Bank funded projects, the extended scope of the ESF requires the capacity of the staff appointed to manage the E&S risks of the project to be assessed along implementation. Based on the assessment, arrangements will be made for capacity building on the ESF.

Table 3: Skills mix required for the duration of project implementation

Skills Needed	Number of Staff Weeks/Year	Number of Trips
Task Team Leader/ Agriculture Specialist	8	At least 2 mission per year
Technical (Agribusiness and Value Chain)	4	At least 2 missions per year
Technical (Water Management Specialist)	4	At least 2 missions per year
Technical (Irrigation Specialist)	4	At least 2 missions per year
Technical (IT Specialist)	6	At least 2 missions per year
Technical (Seeds/Phytosanitary Specialist)	4	At least 2 missions per year



Technical (Food Safety and Veterinary Specialist)	4	At least 2 missions per year
Operations Specialist	4	At least 2 missions per year
Project Assistant (Operations)	4	At least 2 missions per year
Environmental Specialist	3	At least 1 mission per year
Social Specialist	2	At least 1 mission per year
FM Specialist	3	Site visits as needed
Procurement Specialist	5	Site visits as needed



ANNEX 2: Detailed Project Description

COUNTRY: Bosnia and Herzegovina Agriculture Resilience and Competitiveness Project

Component 1: Enhancing public support resilience and traceability (EUR 8.44 million)

1. This component aims at improving the efficiency of the entities budgetary resources allocated to the agriculture sector, providing the relevant institutions with access to key information and data for policy programming including climate-smart agriculture (CSA) policy and adaptation/mitigation planning while aligning with EU requirements, and strengthening the extension services in agriculture to improve dissemination of knowledge including on use of new technologies and adoption of CSA practices. It includes the following two sub-components:

Sub-component 1.1 Enhancing Agriculture Information Systems (EUR 5.46 million)

2. This sub-component will support (a) enhancing the farm and client registry (FCR), including the establishment of new registers for priority value chains and other registers, information systems and web portals; (b) developing a payment system with online application functionality (as shown to be highly relevant to ensure implementation of agriculture support during the pandemic given that currently paper application are in use); and (c) strengthening the existing agricultural information system and related geographic information system (GIS) components, including in RS strengthening the existing Agrometeorological Web Reporting and Prognostic System (CARPO), for improved climate information services and support for precision agriculture; and (d) establishing the Farm Accountancy Data Network (FADN) to improve information collection and data use for policy analysis. Improvement of the agriculture information systems would contribute to increasing both the resilience and transparency of the support provided to the agriculture sector at entities' level, while preparing to meet the EU requirements. While the development of FCR (a), CARPO (c), and FADN (d) would contribute to future CSA policy planning, the development of a payment system (b) would contribution to the implementation of CSA measures.

3. The farm and client registry establish under the previous ARDP project and currently installed in MoFTER, FBiH and RS and in use will be updated in terms of hardware and software, and ensure connection with other registers, either currently existing or to be developed under the project. The FADN, to be established under the project, will be designed as a shared, multi-tenant solution and implemented on MoFTER ICT infrastructure with the FBiH and RS having their own individual access and allowing for different sample selection. The FADN is an instrument for evaluating the income of agricultural holdings and the impacts of the agricultural policy support. It is composed by a representative sample, drawn annually, of the farm population. Three criteria for sample stratification are used: region, economic size and type of farming. The number of farms in each stratum is derived from the Farm Structure Survey. FADN defines a threshold based on economic size and draws the sample for farms over this threshold. Hence, FADN sample is representative of all farms above this threshold (and only farms above this threshold define the FADN population in every given year). Given that FBiH and RS implement their own agricultural policy support, the FADN will be used by each entity for its own sample of farms and analysis of the respective agricultural policy.

4. Activities included under sub-component 1.1 will strengthen the capacity of the implementing entities and structures involved in the management both direct support and rural development measures. It would furthermore introduce systems, processes and applications necessary for the management of direct payments which along with the farm and client register, the animal registration and identification system, the payment system modules, etc. will form



the backbone of an emerging Integrated Administration and Control System notably used by EU member states and introduced by pre-accession countries.

Sub-component 1.1: Enhancing Agriculture Information Systems
Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina (MoFTER)
Activities: <ul style="list-style-type: none"> • Strengthen IT and project monitoring staff capacities • Upgrade hardware equipment and reconstruct server room • Develop dissemination portal • Develop Farm Accountancy Data Network (FADN) • Upgrade Farm and Client Register (FCR)
Federation of Bosnia and Herzegovina (FBiH)
Activities: <ul style="list-style-type: none"> • Strengthen IT staff capacities • Provide hardware and IT equipment • Upgrade Farm and Client Register (FCR) • Develop Information System for Livestock Breeding and selection activities • Develop other Registers within the competence of the Ministry • Develop IT system for processing cantonal-level payments • Enhance capacities of inter-operational information system (IIS) • Develop and implement Disaster Recovery Plan (DRP) • Connect public extension services and monitor the performance of extension providers • Integrate the public extension services into the web portal
Republika Srpska (RS)
Activities: <ul style="list-style-type: none"> • Strengthen IT staff capacities • Host and further develop the existing CARPO (Agrometeorological Web Reporting and Prognostic) system • Upgrade of Farm and Client Register (FCR) • Upgrade Land Information System (ZIS) and ETFARM Geographic Information System (GIS) • Implement Agricultural Payment System • Implement Business Intelligence (BI) system • Implement Phytosanitary GIS • Strengthen GIS capacity

Sub-component 1.2 Supporting Climate-resilient Agriculture (EUR 2.98 million)

5. **Development of the BiH agriculture sector requires addressing a number of weaknesses.** These include: pronounced fragmentation of land property; low level of specialization and marketability of production; low yields (considerably lagging behind surrounding countries and EU averages); yield instability and high price oscillations; low productivity in all sectors of agricultural production; insufficient production of local seed and planting material; low quality of seed and planting material which is available on the market (pronounced presence of uncertified material); low



level of farmers' knowledge about technologies, marketing and management; poor and inadequate organization of farmers (lack of functionality and inefficiency of cooperatives and associations of farmers); and poor image of agriculture as such as a line of business.

6. **High level of fragmentation in supply chain along with a high number of small-scale producers and similar fragmentation of processors cause increase in trade costs.** Retail network benefits most from local trade in agricultural and food outputs. Lack of linkages and disorganization deprive farmers of possibility to negotiate with suppliers on favorable purchase terms and conditions of larger quantities of inputs such as seeds, mineral fertilizers, protection agents, etc. Due to seasonality and lack of storing capacities for their products, fruit and vegetable producers are not able to generate bigger income. Similar to other agricultural producers in BiH, they are poorly organized and production for a prominent buyer is almost non-existent. This is accompanied by ineffective tariffs, poor transport network and a lack of market information system which all results in low income of food producers.

7. **Input producers are almost non-existent in BiH and inputs are largely imported.** Seed production is poor and production of seedling material is insufficient. Though the internal input market is liberal, producers do not see the benefits from low prices of imported inputs. Traders have the biggest benefits from these prices which contributes to lower competitiveness of local agricultural production. In general farmers in BiH pay more for their inputs and receive less for their outputs making them less competitive relative to their equivalents in neighboring countries.

8. **At the same time, the BiH agriculture shows many strengths as well as area for significant improvements.** These include: existence of tradition in agriculture with preserved autochthonous varieties of plant (e.g. fruits and grapes); improved assortment in plant production and breed composition in animal production; trend of increase in the number and market share of large commercial producers; pronounced trend of increase in the number of registered farms; enhanced competitiveness in some sectors of agriculture (e.g. wine, berries, vegetables); growing awareness about the existence of standards in production and the need to introduce them in practice.

9. **Consequently, a good perspective exists for a significant increase in agriculture productivity in BiH, as regards to yields, quality, and value.** To achieve this, a number of activities and measures are critical, such as development and promotion of more niche market, higher value, including organic, agriculture products; transfer of knowledge and technologies in agricultural production; technical and technological modernization of agricultural production; intensification of agricultural production; diversification of activities of agricultural holdings; branding and protection of indigenous, typical and regional products.

10. **In parallel, climate change exposes the food systems to increasing and potentially devastating risk.** Less predictable and more extreme weather - from droughts to floods - increases farmers' costs. Exposure to loss threatens domestic production in many countries to the point of imperiling their food security and increasing the risk of disruption to international markets. As the unpredictability and extremity of damaging weather increases through climate change, there is an urgent need to find climate resilient crops and crop varieties, and for decision-makers to promote them. Crop adaptation to climate change requires accelerated crop variety introduction accompanied by recommendations to help farmers match the best variety with their field contexts.

11. **The use of adapted crops and varieties (either annual or perennial) helps to reduce the negative impacts of climate change on agricultural systems and at the same time to ensure stable agricultural production.** Introducing new crops or varieties, or bringing back heritage crops, leads to diversification of agricultural production, with positive effects on biodiversity and ecosystem services, in particular if cultivated in association with conservation agriculture practices (including minimum soil disturbance, permanent soil organic cover and crop species diversification). It also strengthens



the ability of the agro-ecosystem to respond to biotic and abiotic stresses and reduces the risk of total crop failure. Moreover, introducing the cultivation of adapted crops and varieties can improve soil carbon storage by accelerating atmospheric carbon sequestration. In addition to the use of already existing genotypes, plant breeding can provide a portfolio of varieties of an extensive range of crops to adapt production systems to climate change. The development of new plant species and varieties commercially sustainable and resistant to different risks involve the preservation of multiple varieties, landraces, rare breeds and closely related wild relatives of domesticated species to maintain a genetic bank for use in the selection of novel traits that are resistant to various stresses.

12. Since all stages of the BiH food value chain are expected to be affected by extreme climate events associated with climate change and its slow onset impacts, taking adaptive measures in both the short term and long term will be required. The development of sustainable food systems will only result from using a system's analysis at all levels to design impactful interventions and measures. The objectives of climate-smart agriculture – to sustainably increase agricultural productivity and incomes; adapt and build resilience to climate change; and reduce or remove greenhouse gases, where possible – can be addressed using a food systems approach. Utilization of improved seed varieties that are adapted to climate change (e.g. drought-resistant, heat tolerant and flood tolerant), combined with diversification through agroforestry, intercropping or other diversification strategies, appear to be most obvious measures for climate adaptation and mitigation.

13. **Considering the above and the fact that the domestic supply of seeds and seedling material covers only approximately 5 percent of the BiH demand, enhancement of the capacity for seeds and seedling production is warranted.** For an effective improvement to take place the following should be supported: (a) increase in multiplication of certified seeds and seedling material; (b) intensification of breeding programs to produce local varieties highly adapted to local conditions; (c) promotion of wide use of certified seed material by farmers; and (d) promotion of multiplication of local varieties to be further used by BiH farmers.

14. **In particular, the aspect of multiplication of certified seed material shall be considered as highly attractive for smaller farmers.** Small farms can be used for production of certified seed and seedling material, which is normally of higher value, thus making farming more profitable. The increase in domestic demand shall ascertain easy distribution and sales. It is therefore necessary to prepare and implement the country-wide coordinated programs of support for production and multiplication of high-quality seeds and planting material as well as its marketing and sale.

15. **The Agricultural Institute in Banja Luka plays a crucial role as regards breeding new varieties and production of certified seed and seedling material on the BiH market.** The project will considerably enhance the capacity and productivity of the Institute, by financing purchase of agricultural machinery and construction investment. As a result, the supply of domestically produced varieties shall be higher. This, in parallel with intensive information campaigns aiming at farmer's awareness increase, shall result in more common use of domestic varieties, be it for multiplication or other usable purposes.

16. **In this context, the extension advisory services have an important role to play.** The extension advisory services serve as a linkage between the scientific institutions and farmers to transfer the professional knowledge onto the practical ground. Their role and relevance cannot be underestimated and needs to be well acknowledged. To be fully professional, on one side, and effective and efficient in knowledge transferring, on the other side, those services must be well prepared and equipped, including possession of transportation and communication tools. The project will substantially contribute to the institutional building of advisory services in BiH, and this will include purchase of relevant necessary equipment (office and IT equipment, vehicles, etc.) as well as supporting dedicated training courses. The specific role of extension services shall not only be related to the promotion of domestic varieties and new technologies,



but also promotion of climate-smart agricultural practices as an important element for sustaining BiH agriculture in the face of climate change.

17. **The project will benefit from cooperation and synergies with an ongoing EU Twinning project.** The *“EU’s support to capacity building and gradual Union acquis alignment in the phytosanitary sector in BiH”*, includes activities related to enhancement of seed production in BiH, along with strengthening capacities in area of Plant Breeders' Rights. The Twinning project *inter alia* includes: further approximation of BiH legislation with that of the EU and the International Union for the Protection of New Varieties of Plants (UPOV) Convention; implementation of certification schemes in area of seed and propagation material (including OECD and ISTA schemes); testing and identification (molecular) of cultivars; as well as requirements for accreditation in line with ISO 17065 standard.

18. **BiH has already ratified the UPOV Convention and, as a member of the UPOV organization, has undertaken relevant obligations to duly implement it.** In this regard, it is highly advisable that relevant competent authorities in BiH are internationally assisted in the implementation of the Convention, through implementation of best practice and in drafting legal and operating regulations that are relevant and necessary for the Convention’s implementation. However, the country is not yet in the OECD scheme, which is of great importance for the sector’s potential and growth. Establishing the production of certified planting material shall raise the production of planting material to a higher level. There have been technical preparations undertaken in this field, including use of OECD guidelines for both certification schemes and sampling for laboratory analyzes. However, a lot of work is to be carried out by the sector and this is expected to be accomplished under both the twinning and the project.

19. **The project support will aim at developing internal procedures and any other administrative act necessary to manage and implement the breeder’s rights.** Such work will be preparatory for the establishment of the registers and their functioning. Further, it will be important to develop a specific information and/or awareness campaign among the producers (particularly seed companies and nurseries). The aim will be of informing about the possibility of establishing new commercial relations with breeders and companies for multiplying in BiH the patented varieties (protected by UPOV) of higher quality. This result shall be obtained mainly based on coaching activities toward PHPA staff and training to staff of all institutions involved in the PBRs system (Entities Ministries and Institutes).

20. **Implementation of the Convention and understanding of the possibility deriving from it requires dedicated awareness campaigns.** Final beneficiaries (i.e. farmers, seed companies, nurseries, and breeders) will benefit from specific information to increase awareness about issues related to protection of varieties and the possibilities to introduce new and improved patented varieties in BiH, which are the basis for an improvement of the agricultural production. The action shall be organized through meetings and seminars around the country, possibly associated to other project activities or events organized extension services or scientific institutes.

21. **Methods and procedures for both field testing and laboratory analyses will be developed.** The project will support the relevant laboratories and technical staff performing the field inspections for the OECD certification. In this regard, the sector would benefit from the development of the manual for certification procedures considering other annual crops interesting for the BiH seed sector, which could then provide an opportunity for rural development. In parallel, the laboratories will increase their capacity through the introduction of the ISTA scheme and analytical methods obtained through the Twinning project support in developing the procedures and trainings on analytical methods.

22. Further development of operative procedures (manual/instruction) according to the ISO standard for the inspection bodies (ISO 17065) and the training of the staff involved in both field and laboratory control activities will be required to improve the capacity of the staff related to the implementation of the certification scheme for seeds (OECD)



and planting materials (CAC or certified).

23. **The improvement of field control capacities shall be paralleled by the increased capacity of laboratories performing the analysis of both quality (seeds) and identity (seeds and planting materials) characteristics.** This includes increasing capacity in the implementation of the methods (particularly those related to DNA-based techniques) needed to define the quality (ISTA) and identify the varieties (UPOV or other internationally adopted procedures).

Results monitoring and potential risks involved

24. Implementation of activities included under the sub-component require human, financial (including for operations and maintenance) and organizational resources as well as monitoring and evaluation of results to ensure successful operationalization. The table below specifies crucial steps to be achieved in a specified timing. Adherence to the schedule will ascertain that the project's objectives are fully met by project completion.

Table 1: Monitoring and evaluation of results

Outcome	Output (result) indicator	Timeline	Comment
Enhance capacity to produce certified seeds and seedlings, and improvement of extension services	Tender documentation prepared, including the equipment specification	By project effectiveness	The specification of the equipment shall be, on one hand, detailed and precise, on the other hand – shall not indicate any specific provider, so that the rules of fair competitiveness are observed.
	Relevant agriculture machinery and equipment purchased, installed and in full operation	Within 4-12 months from project effectiveness	It is necessary for the beneficiary to provide specialists who can operate the purchased equipment.
	Relevant construction works completed and laboratory equipped	Within up to 2 years from project effectiveness	The beneficiary shall purchase all necessary devices and equipment which are needed for implementation of laboratory techniques related to the use of the procured chromatographs.
	Amounts of certified seed and seedling plant material increased (as regards both production and supply on the domestic market)	Approximately after 3-4 year from project effectiveness	Any other needs related to the implementation of the analytical methods (i.e. residues, chemicals, microbiological, somatic cell count, reagents, training,) recognized and successfully completed; methods to be implemented and validated; preferably the laboratories shall participate in proficiency tests.
	Extension staff adequately equipped and prepared for the equipment's use	Within 1 year from project effectiveness	National system of sampling and samples delivery developed, including specific sampling calendar in order to avoid accumulation of a high number of samples delivered to laboratories at the same time.
	Extension staff trained in climate smart production practices and/or technologies	During first 2 years of the project implementation	Of functioning laboratories, one shall be designated as the National Reference Laboratory(s) in food safety, animal health and plant health, which would serve as a reference and verification laboratory(s) for all the other sectoral laboratories.
	Farmers trained by	Commencement in the	Time as well as human and financial resources need to



	extension services in climate smart practices and/or technologies	3 rd year of project implementation	be reserved for all activities related with preparation towards the process of accreditation of laboratories and/or laboratory methods.
--	---	--	---

25. **Achievement of the project's development objective require anticipation of keys risks and corresponding mitigation measures.** The table below summarizes the main risks that can be anticipated, along with their ratings and proposed mitigation measures.

Table 2: Risk ratings summary table

Description of the risk	Risk rating	Mitigation measures	Residual risk rating
Scientific and technical staff not capable to operate the purchased agricultural machinery	L	Training on the use of the purchased machinery	L
Extension services not capable to operate purchased equipment	L	Training on the use of the purchased equipment	L
Not sufficient finances for maintenance, insurance and repairing of the purchased vehicles	M	All needs shall be recognized well in advance and ascertained (this means that additional BiH finances may need to be dedicated)	L
Garages for the purchased cars not available	M	In cases where garaging facilities are not in place, this shall be sorted out either by purchase/construction, or renting	L
Farmers not eager to adopt and use domestic varieties	L	Information campaign on benefits from the use of such varieties; some incentives such as partial reimbursement of costs of the seed material buying	L
Farmers not eager to divert on high value crops, such as production of certified seed material	S	Broad and intensive information campaign by extension services, supported by practical examples presenting potential financial benefits from such production; governmental support as regards marketing of such seed material	M
Farmers not eager to adopt and use climate smart production practices	S	Broad and intensive information campaign by extension services, supported by practical examples presenting potential benefits	S
Laboratories not prepared for testing of bigger amounts of certified seed material	M	Testing needs shall be regularly monitored (based on the scale of domestic production) and capacities of the respective laboratories shall be upgraded accordingly	S
OVERALL	M		M

H – high; S – substantial; M – moderate; L – low

26. **The main risk is related to the adoption by farmers of the new domestic varieties, technologies and climate smart production practices.** Farmers often rely on their current practices, perhaps less profitable, but stable, and are skeptical towards introducing innovative solutions, avoiding uncertainties and financial risks. In this regard role of the



authorities, scientists, advisors, and associations is to promote new solutions and raise the farmers' interest. A good approach to this is providing examples of successful achievements by other farmers after the change of the farming practices. Also, some financial incentives can be applied, such as reduction of taxes or providing subsidies, better organization of the market, support for farmers associations, etc.

Component 2: Improving agriculture productivity, adaptation to climate change, and enhancing linkages with markets (EUR 40.43 million)

Sub-component 2.1 Strengthening Value Chain and Developing Productive Partnerships (EUR 6.65 million)

27. **Low productivity, fragmented production, and limited integration of producers along supply chains constrains competitiveness, value adding and efficient marketing in the sector.** The average smallholder farm in Bosnia Herzegovina (BiH) is about 2 ha which is used for a diverse range of livestock, cropping and horticultural activities. Yields are below their potential due to lack of inputs, know-how, modern equipment, support services, finance and specialization. Smallholders and micro-, small- and mid-sized enterprises (MSME) have difficulties accessing affordable credit for investments in value adding services such as packaging or storage. But many new business opportunities have arisen for savvy local entrepreneurs such as sole traders providing bulking-up services to smallholders and selling to processors or wholesalers; business service providers supplying marketing information and solutions, input suppliers, contract machinery services, bulk milk transportation etc. to their clientele. Nonetheless, increasingly, small-scale farmers in BiH are competing against lower priced imports in local markets.

28. **Many large, often multinational companies are leading the processing, wholesaling, trading and retailing sectors in BiH, connecting local production with domestic and international markets.** Most medium and large post-production enterprises have difficulties sourcing desired volumes of quality produce locally and do not want to deal with many small-scale farmers rendering collection and transport costs higher, and thus, deal with large-scale traders and wholesalers who import significant proportions of their produce from nearby countries. Only 35 to 40 percent of BiH food needs are met through local production and smallholder farmers continue to be squeezed out of their local markets by superior quality imports. These companies also rely for their supply on local traders who need to operate collection points (bulking centres) or travel long distances to collect sufficient quantities of produce from a number of smallholders. Smaller traders sell on to larger traders or wholesalers in urban centres, which results in high priced, but lower quality produce for sale on local markets. Beside the issue of sourcing products, these agribusinesses face difficulties in collecting qualitative graded products respecting food safety standards, impacting their competitiveness, profitability, and leading to difficulties or incapacity to reach retail chains market or new international outlets, in particular promising EU market. The upgrading of existing processing lines and storage facilities is needed to increase productivity and improve standards compliance. Additionally, the lack of legal contracts of supply between these companies and farmers result in supply chain dysfunctions, producers who have received support from one processor are able to supply another if a better price is offered. Processors state that during the season they operate at an overall average of 60 percent of design capacity.

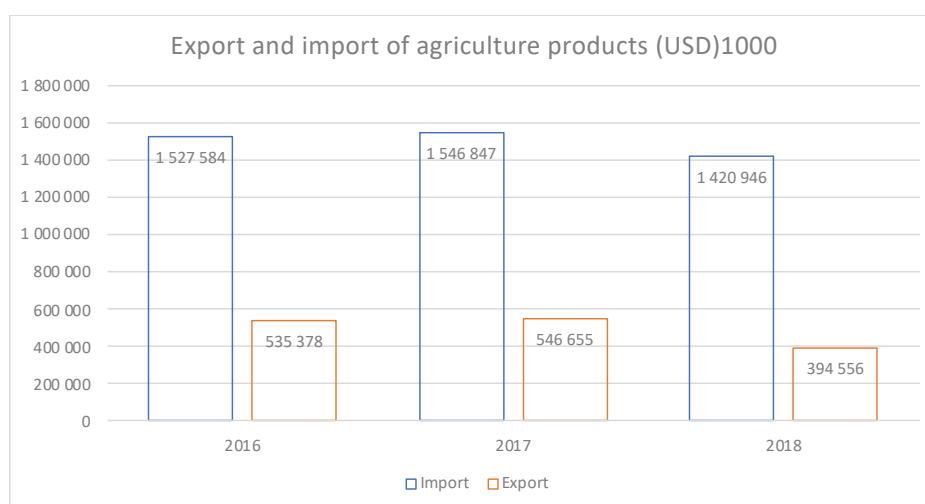
29. **The main place for purchase of fresh products, in particular fruit and vegetables has been the traditional “next-to-home shop” for decades,** consumers still purchasing their fruit and vegetables on the open-air market, particularly in the case in urban areas. Nonetheless, large retailers have increased their presence over the last years. The most significant development in the retail market is the emergence of large distributors, most of whom are foreigners, Konzum (Croatian supermarket chain), Interex (French supermarket chain), and local distribution companies including MIMS Group, Tropic Centar, Bingo and Robot Komerc.²⁰ These retail chains are important buyers of fresh products, in particular

²⁰ Euromonitor, July 2017



fruits and vegetables and dairy products, but the lack of quality/price competitive domestic products responding to high food safety and packaging standards has led to the sourcing of imported products, reducing potential outlets for domestic value chains.

30. **Local consumers are becoming more sophisticated and demanding better quality food.** Thus, they are attracted by foreign brands and products which are competitively priced, attractively packaged and presented, assured quality standards and supported by advertising. They increasingly prefer to shop in supermarkets rather than produce markets, and food retailing is dominated by supermarket chains that demand quality at the lowest costs possible. Changing consumer preferences have contributed to the development of new market segments that BiH's domestic producers have been unable to capture. Both exports and imports of agri-food products have risen, but the rate of imports has grown faster than the rate of exports, with a ratio of some 3:1 in food imports to exports in 2016, while this ratio was roughly 4:1 in 2018.



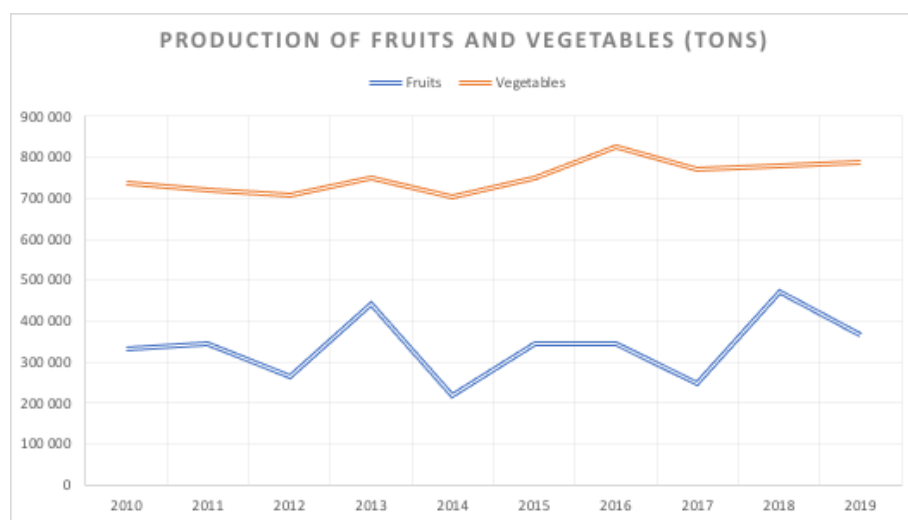
Source: FAO stat 2021

31. **Opportunities exist, however, for producers and local agribusinesses willing to adapt and compete with imported produce particularly in higher value markets (e.g. fruits and vegetables, berry fruits, dairy products, meat).** Indeed, local agribusinesses operate with varying degrees of success, dependent on management capabilities and their ability to adapt to new commercial realities, and levels of foreign competition and ownership in the local business environment. Foreign-owned agribusiness companies, with higher food safety and quality assurance standards and understanding of markets have caused many local businesses to either adapt - resulting in steep increases in productivity and variety in final product range or business failures. Therefore, agribusinesses are growing into larger, but fewer, entities located in the vicinity of major urban centres; that profit from larger-scale business operations and economies of scale. Additionally, some initiatives in berries sector have demonstrated interesting result in terms of market linkage and capacity for local production to reach new outlets on the domestic market and export. The operation consisting in linking medium scale cold storages in different projects implemented in BiH with buyers abroad allowed the direct export of important quantities of raspberry to Bischofszell (one of the main Swiss fruit processing companies, subsidiary of Migros, number two of the food retail). This pilot should be upscaled in the coming years offering a possible secured market for small-scale processors. The value of export for BiH tripled from 2012 to 2016 (UN Comtrade), main destination being EU 15.



Fruits and vegetables sub sector analysis

32. Among the main promising sub-sectors, fruits and vegetables present most potential of development for domestic and international markets. With a total production of 788,000 tons of vegetables and 364,000 tons of fruits in 2019, this sub-sector is key for BiH's agriculture sector. The production slightly varied during the last decade (mainly vegetables) keeping an almost constant trend. Main products are plums (114,415 tons, 2019), apples (98,265 tons, 2019), cabbages (71,773 tons, 2019), chillies and peppers (44,633 tons, 2019), cucumbers and gherkins (34,343 tons, 2019) and tomatoes (43,700 tons, 2019). Berries and particularly raspberries (19,749 tons, 2019) and strawberries (10,582 tons, 2019) present an interesting rising trend of production. The production of fruits and vegetables in BiH is extremely important because it provides food security (primarily vegetables) and income (primarily fruits) to rural agricultural holdings. Total income and profit per hectare are higher than in other sectors, and this is particularly important considering BiH's farming structure, with a high number of smallholdings. Despite these achievements and opportunities, the fruit and vegetable sub-sector continues to face important challenges in particular (i) weak vertical integration of the supply chain; (ii) low productivity, low yields compared to other countries of the region; (iii) insufficient storage and processing facilities, outdated, inadequately distributed and not owned by the producers themselves; and (iv) insufficient and improper organization of the collection, classification, storage and transport of fruits in Bosnia and Herzegovina. Additionally, BiH vegetable production suffers from a structural lack of competitiveness. The lack of large scale producers and weak value chain coordination plays in favor of foreign producers, especially in the eyes of supermarket chains that need large quantities and regular supplies. This explains the significant growth of imports at the cost of domestic producers.



Source: FAO stat 2021

33. The fruit and vegetable supply chain in BiH is characterized by a variety of points of sale: (i) importers' storage facilities; (ii) large producers and cooperatives' yards; (iii) supermarkets; (iv) processors; (v) wholesale markets; (vi) local shops and greengrocers; (vii) green markets. There are numerous types of retailers and traders at each of these points: (i) large importers and traders of fruit and vegetables; (ii) supermarket purchase agents; (iii) packaging house supply and selling agents; (iv) large traders working on the wholesale market; (v) traders that supply small shops; (vi) middlemen with trucks or cars, and (vii) vendors on green local markets. The characteristics of the fruit and vegetable supply chain in Bosnia and Herzegovina are:



- A large number of small importers that prevents cartelization, a phenomenon widely spread in the western Balkans
- Very dynamic middlemen; both small and large and either domestic or from neighboring CEFTA countries
- Wholesale markets do not fulfill their potential role
- A small number of packaging houses that harmonize the offer and add value to the product
- Small but growing market share of supermarkets compared to green markets

34. **Fruit and vegetable production requires important investments.** Technology and infrastructure for storage and processing are important assets that are in many cases not transferable to other sectors. Though the Return of Investment is one of the highest compared to other areas of the agricultural sector, the payback periods are long and require a high financial discipline from the investors (e.g. for apple orchards you need a much higher investment to get a return compared to annual crops). There is a need for higher investments to mitigate risks such as hail and frost in order to protect the interests of the lender and the lending party (e.g. anti -hail nets or anti -frost systems). A considerable risk factor in this context is also the deficit of technical know-how and the lack of experience in farm and company management that can put an enterprise at risk. The level of assets and technology, as well as the knowledge of fruit and vegetable growers needs to be improved to increase competitiveness of domestic production. This is particularly the case for:

- Post- harvest operations (sorting, grading, packaging), which are mostly carried out manually.
- On-farm storage facilities which are also underdeveloped, causing losses of significant volumes of product. A farm survey led in 2012 (FAO Fruits and Vegetables sector review, 2012) shows that less than 3 percent of interviewed farmers had proper equipment for the handling and storage of fruit and vegetable.

35. **There are two main challenges in establishing efficient fruit and vegetable supply chains.** The first is how to involve small-scale producers in modern supply chains, as they are often not competitive, operate in informal channels and cannot afford investments to comply with market standards. The second is how to increase the fruit and vegetable processing competitiveness to penetrate new markets and subsequently increase demand for the raw materials. In Bosnia and Herzegovina, the current situation is characterized by high competition in primary production and low competition among food processors.

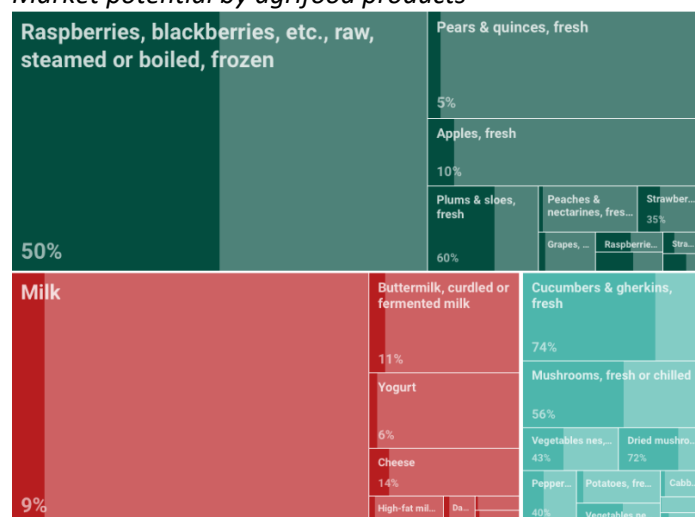
Market potential for agriculture products in EU markets (ITC Trade Map 2021)

36. Analysis of ITC trader map highlight an interesting potential for export development of BiH agriculture products. The room for improvement according to potential enhance to support the development of export capacity and competitiveness for fruits and vegetables as well as dairy sub-sectors towards EU markets. Main agriculture products with export potential to EU markets (Western Europe) as studied by ITC Trade Map are:

- Berries (raspberries, strawberries in particular)
- Apples, pears
- Dairy products (milk and cheese)
- Mushrooms, peppers, and potatoes

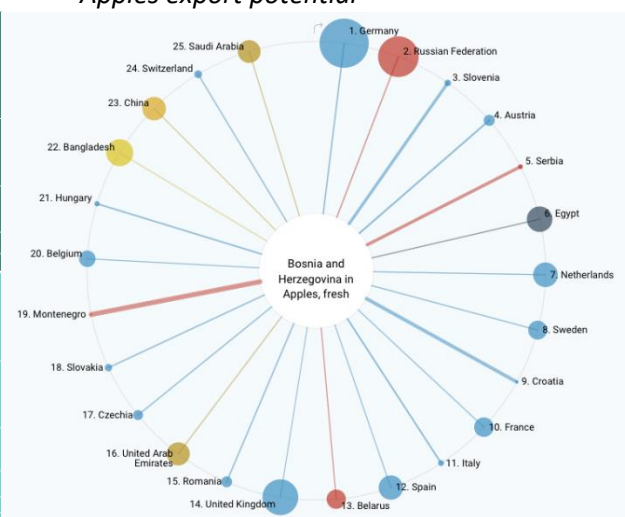


Market potential by agrifood products



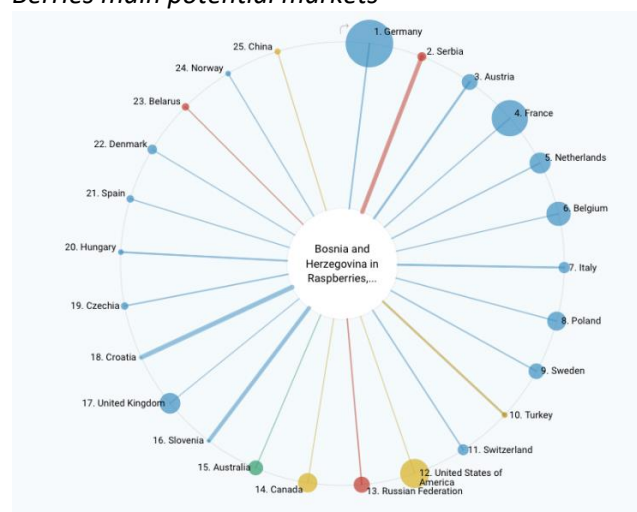
Source: Trademap ITC -2020

Apples export potential



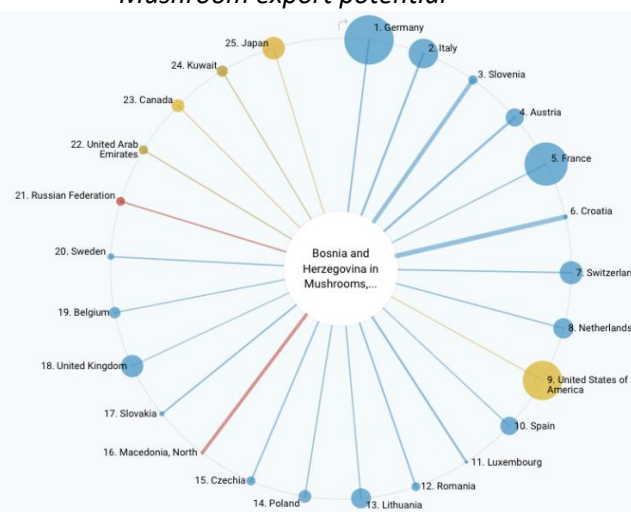
Source: Trademap ITC -2020

Berries main potential markets



Source: Trademap ITC -2020

Mushroom export potential



Source: Trademap ITC -2020

Matching grant scheme description

37. In this context, it is essential to leverage private sector investments into value chain development and promote productive partnerships between producers and agri-businesses (processors and aggregators) in various agriculture sub-sectors with good economic and resilience/adaptation potential and primary integration through a matching grant window. The overall aim is to improve productivity, quality, value addition, and market linkages within different subsectors to enhance their resilience and competitiveness towards increased domestic market access and exports, as well as job creation, improved beneficiary incomes, and increased economic opportunities for women and youth in the rural sector. Specific objectives of the matching grant scheme are (i) the enhancement sub-sectors by increasing



production potential and quality in primary production and processing competitiveness; (ii) the improvement of the access to and the adoption of technologies, knowledge and markets; (iii) the strengthening of technical and managerial capacity of smallholder farmers in the farming and agri-business sectors; (iv) the promotion of cooperation between the value chains actors with regards to production of market-oriented products by introducing and/or improving quality and safety standards in production, and marketing; and (v) the strengthening of subsectors resilience to climate change. The key drivers for the design of the matching grant scheme are (i) a competitive matching grant program to attract potential beneficiaries; (ii) clear eligibility and selection criteria and procedure; (iii) taking into consideration the features of the EU for Agri matching grant program to benefit from experience, beneficiaries' awareness and avoid competition between the programs. The matching grant program will cover the entire territory and focus on sub sectors and activities with high participation of women to promote gender integration in the value chains aiming at contributing to an increase of their income. Specifically, it will include eligibility and selection criteria that enable more women to participate in grant application, and also provide support to improve women producers' access to knowledge, inputs, markets, and associations, to increase the number of female producers participating in value chains.

38. Expected benefits from the matching grant scheme include upgraded production and processing standards and technologies that would improve the capabilities of producers and businesses to value-add; meet international quality standards; develop economies of scale; and be more competitive. Increased smallholder farmers' access to markets and investment in higher value production would also result in increased demand for related production inputs and services, thus further contributing to increased demand for labor. The drivers for change are the producers and business entrepreneurs, who are prepared to invest their resources into promising new opportunities, and who would lead their peers.

39. Matching grants will be provided to *aggregators* (direct beneficiary) as they play a key role for market linkage based on their knowledge of buyers' expectations, providing to small holders (indirect beneficiaries) outlets for their production, as well as the capacity to improve the quality of their products, and impose food safety standards which will result in the improvement of the competitiveness of the entire value chains. Aggregator in the sense of this grant scheme can be any business entity handling and/or procuring agriculture produce, who will directly cooperate and link with producers by supporting input supplies, marketing of the agriculture products in the internal and external markets (i.e. private collection centers and agro-processors, cooperatives, cluster of association of producers if ready to register separate business entity). The matching grant program will target a total of about 1,700 direct and indirect beneficiaries of which 20 percent women and youth (considering that each aggregator works with about 30 smallholders in RS: about 30 aggregators will involve a total of about 1,000 smallholder farmers and in FBiH: about 20 aggregators with about 600 smallholder farmers) and all direct and indirect beneficiaries will have access to technical assistance.

40. Building and increasing knowledge and capacity of the aggregators and farmers to comply with market requirements will be achieved by a tailor-made technical assistance designed through a preliminary assessment of concrete demand and needs of farmers and aggregators. Provision of technical assistance will be mainly done by advisory services recruited nationally and internationally (i.e. NGO, consulting company, university, individual consultant registered as business entity, partnership or consortia of the above entities). The technical assistance would be tentatively directed at: (i) improving livestock and horticultural production and productivity; (ii) lifting the quality of livestock, fruit and vegetable products, avoiding food loss and waste along the value chain, and (iii) building capacity to reach international standards for certification (GLOBALGAP). The budget allocation for the sub-component would possibly vary between the entities, with an estimated amount of EUR 400,000 (USD 500,000) for RS, and EUR 250,000 (USD 300,000) for the FBiH 10 percent of total amount allocated to matching grant scheme).

41. The selected eligible sub sectors are fruits and vegetables, meat (cattle) and dairy as they respond to different



criteria, in particular their (i) role in the agriculture sector, (ii) their potential of development (market demand and international export) and income generation for smallholders, (iii) a preliminary identification of leader companies to structure the entire value chain and improve vertical and horizontal integration, access to market and competitiveness, and (iv) their link with irrigation development sub-component. The sub-sectors will be prioritized in the selection of granted investments in a differentiated approach according to RS and FBiH priorities of agriculture development, in particular priority to fruits and vegetables, dairy products and meat (cattle) subsectors for RS and to fruit and vegetables and dairy products for FBiH. These selected sub-sectors are relevant and attractive to women's participation.

42. The budget allocation for the sub-component amounts to EUR 6.65 million (USD 8 million) with an estimated amount of EUR 4.15 million (USD 5 million) for RS, and EUR 2.5 million (USD 3 million) for the FBiH. An estimated amount of EUR 3.75 million (USD 4.5 million) for RS, and EUR 2.25 million (USD 2.7 million) for the FBiH will be allocated to the grants window, and 10 percent of the total amount to the technical assistance (respectively EUR 400,000 (USD 500,000) for RS and EUR 250,000 (USD 300,000) for FBiH. Grants will be awarded on the bases of the evaluation and selection criteria as well as procedures described in Matching Grant Manual.

43. The size of eligible investments and grants will be adjusted to respond to current needs and allow a true and efficient leverage of private sector investments in the targeted sub-sectors.

44. The matching grant scheme will finance 65 percent of the total eligible investments under the grant application. The applicant will co-finance the remaining 35 percent. Co-financing must be in cash and the participation of some other type of co-financing will not be considered. The grant applications and the budget for their implementation must be designed for completion not less than 12 months and not exceeding 14 months. It is expected that four calls for investments (2 in RS and 2 in FBiH) will be completed during the 4 years of project implementation. However, the number of calls will be adjusted according to the absorption capacity and lesson drawn from the first-year grants' implementation.

45. Investments to be co-financed under the matching grants could include: provision of adequate agriculture inputs (appropriate fertilizers for precision agriculture, climate-tolerant seeds), renewable energy/infrastructure, greenhouses, investments in energy-efficient cold-storage rooms for the preservation of produce, vegetable and fruits washing/cleaning equipment and technologies, equipment for drying of fruits and vegetables, refrigerated vehicles for improved transport conditions and reduced food loss and waste along the value chains, or investments in canning facilities at farmer community or aggregator level, investments in selected local markets to reduce food loss and waste, innovative solutions for greener and more sustainable livestock production (e.g. low emission feeds, improved manure management for circular use), among others. The grants will also include provision of technical assistance available for the applicants including for the preparation of business plans, carrying out procurement procedures, etc. as needed.

46. Specific eligibility and selection criteria have been developed to support profitable project, market linkage for producers, innovation transfer, connection with sub-component on irrigation systems development and participation of women and youth. All applicants will have to submit a profitable business plan for the investment including participation of a minimum of 30 small holder producers, demonstrate the introduction of innovation/green technologies to improve competitiveness and resiliency. Preferential ranking will be provided to applications which will include 50 percent women small holder producers. The matching grant will not support individual applications exclusively for irrigation systems development, while climate smart irrigation equipment (dripping, solar panel pumps, etc.) may be include by aggregators in their application to be provided as inputs to agriculture producers. Higher ranking will be assigned to proposed investments in areas provided with irrigation (only for fruit and vegetable applications). Finally, 20 percent of beneficiaries (workers in agro processing/aggregators companies, farmers) will have to be women and young farmers to promote gender and youth engagement.



Sub-component 2.2 Improving Irrigation and Drainage Systems for Climate Change Adaptation (EUR 33.78 million)

47. **Over the past decades, extreme weather events have become more frequent in Bosnia and Herzegovina.** The years of 2000, 2003, 2007, 2008, 2011, 2012, 2013, 2015 were considered to be extremely dry, while the floods of 2001, 2002, 2009, 2010, 2014 severely impacted the country's economy, people and their livelihoods. Due to climate change, it is expected that these hydrometeorological hazards will not only increase in frequency, but also in severity in the coming years.

48. **The "FBiH Agricultural Development Strategy for 2015–2020" underlines the impact of climate change on agriculture productivity.** A decrease in yields due to reduced precipitation and increased evaporation, as well as a potential decrease in livestock productivity and increased incidence of agriculture pests and crop diseases as a result of climate change is expected. Across BiH crop yields, and potential options for growing high-value crops and double-cropping, are restricted without irrigation primarily due to prolonged dry spells during summer. This problem is especially evident in the Mediterranean south-west, where yields may be 30-40 percent less without irrigation. For example, in Ljubuški in FBiH, typical yield reductions are estimated to be in the order of 37 percent. In the northern areas along the Sava river typical yield reductions may be around 20-30 percent, with less in the central and mountain areas.

49. **Lack of water is a key factor limiting the development of agriculture in the region close to the Adriatic Sea.** Soil water deficiency is relatively high in this part of the country, making irrigation a pre-requisite for getting higher yields. On the other hand, in many of the plains and valleys – productivity regularly suffers from water logging and inundation, making drainage as important as irrigation. Irrigation certainly represents one of the key mechanisms for climate change adaptation in agriculture.

50. The "FBiH Development Strategy 2021-2027" includes several measures that highlight the relevance of construction of private and public irrigation and drainage systems for agriculture and food production, rural economic development, and sustainable management of water resources.

51. **There is a high potential for irrigation because the abundance of water is one of the main characteristics of the water balance in BiH.** Only 2.8 percent of total abstracted water is used for agriculture. Estimates of real irrigation needs in BiH indicate that this is not sufficient when considering spatial and temporal variations in precipitation and the need for revitalizing the rural economy. Rural areas are an important part of BiH, due to the fact that they cover 85 percent of the territory of FBiH and 95 percent of RS, where about 50 percent of the total population of FBiH and 83 percent in RS lives respectively.

52. Constraints to irrigation improvements include (i) land fragmentation, with parcels often only 0.2 to 0.3 ha per plot; (ii) intensive efforts still required to form Water Users' Associations (WUAs), and potential difficulties in collection of water use fees; (iii) relatively high cost of schemes partly due to the dilapidated nature of the former systems; (iv) environmental issues especially in the Neretva river valley; and (v) institutional and regulatory issues with respect to water charges.

53. The experience of BiH relevant line ministries in irrigation projects is limited as they have been more deeply involved in flood protection and drainage. Thus, capacity-building in terms of strengthening the planning capacity of agencies is required.

54. As municipalities are responsible for the management of irrigation systems, they engage several actors for this responsibility. Essentially five modalities of management exist: (a) Private limited responsibility companies for the large



farms, (b) Public utility companies, (c) Cooperatives or other types of producers' associations, (d) WUAs (which at the moment are not legal), and (e) Mix of private company, WUAs and other stakeholders.

55. WUAs are registered as voluntary associations as the Water Law does not provide a special chapter on WUAs. This represents a limitation, since their semi-public nature is not recognized and, therefore, their authority to manage public infrastructure is not clear. So far, their capacity to operate and maintain public irrigation systems is generally accepted. By-laws for the establishment of WUAs were formulated in the past in the FBiH but not approved yet. In the RS a draft by-law has been prepared recently and approval is expected in the near future.

Sub-component Activities

56. This sub-component will help improve the irrigation and drainage systems development and management and strengthen climate-smart agricultural practices as two core elements of the resilience and adaptation agenda in agriculture. Energy-efficient irrigation systems and renewable energy infrastructure will be promoted to mitigate GHG emission. Experiences of the recently completed Bank financed IDP showed significant potential for improving agricultural production and productivity thereby enhancing farmers income, specifically when the irrigation water is utilized for the production of high value agriculture products. In BiH, access to irrigation allows earlier planting and creates possibilities for double cropping, crop diversification, and use of more efficient and water saving irrigation technologies – aspects that are critical for obtaining higher prices due to being able to provide markets earlier, increasing productivity per hectare due to more intense use of the available land area, and controlling water use of the sector. With regard to earlier access to markets, international competitive advantage has been recorded for early fruit and vegetable production possible under irrigated areas and milk production which benefits from irrigated forage production such as maize.²¹ Further, design of the sub-component activities rely on the Irrigation and Drainage (Eco)system approach which calls for a rethink on how the irrigation and drainage sector are supported to align the sector with today's and future demands and circumstances. Irrigation and drainage are inherently part of a complex socio-technical-ecological system influenced and affected by weather and climatic, agroecological, socioeconomic, governance, policy, and human behavioral factors. These factors are called "irrigation and drainage (eco)systems²²." In a nutshell, it refers to the biophysical, policies, institutions, and socio-economic circumstances that impinge upon, interact with, and influence the performance of the sector including the achievement of the associated development goals. These (eco)systems play a powerful role in influencing outcomes from investments in irrigation and drainage infrastructure at multiple scales and dimensions.

57. The sub-component will be implemented in coordination with the commercial value-chain investments under sub-component 2.1. Specifically, it will support: (a) selectively developing new and rehabilitating existing irrigation and drainage systems where they prove to economically and sustainably boost agricultural productivity, support diversification towards higher value crops, improve agricultural export competitiveness, revitalize rural economy, and increase resilience of production to climate change impacts; and (b) strengthening the institutional and financial arrangements for sustainable operation and maintenance of the irrigation and drainage systems and improved water resources management planning. The specific activities under this subcomponent will include:

- **Rehabilitation/modernization of selected irrigation and drainage systems.** This will support investments in

²¹ FBiH Development Strategy 2021 to 2027

²² In the present context, the term "(eco)system" has a wider meaning than the literal interpretation of natural ecosystems. The irrigation and drainage (eco)system is a broader term that comprise a combination of hydrological, environmental, social, economic, governance, and human systems that interact upon and influence outcomes of irrigation and drainage sector investments.



infrastructure construction of intake structures, main and secondary irrigation networks, including introduction of modern pressurized systems which enhance efficiency of water use. Energy-efficient irrigation systems and renewable energy infrastructure will be promoted to mitigate GHG emission. The beneficiaries of the irrigation schemes are expected to benefit from the available government and EU sponsored subsidies and matching grant schemes to improve on-farm irrigation systems, which is essential for realizing the benefits of the overall investment. The infrastructure investments under this sub-component will be complemented by market opportunity strengthening through matching grants under sub-component 2.1.

Feasibility studies and detailed designs for the construction/rehabilitation of some existing and new irrigation systems have been developed under the recently completed Bank-funded IDP. The feasibility studies include economic and environmental assessments on the efficiency of proposed infrastructure investments and expected water usage requirements. However, the environmental and social issues were addressed using the old safeguard policies and procedures, thus require updating to align with the applicable Environmental and Social Framework.

- **Strengthening of irrigation and drainage management institutions.** This will include (i) building the capacities of project benefitting municipalities and cantons, and establishing and strengthening participating of Water Users Associations (WUAs), municipal level public utility companies or joint WUA/public utility companies to participate in the operation and maintenance (O&M) of the systems rehabilitated or constructed under the project, including development of O&M arrangements; determination, collection and management of irrigation service fee; and modernization of on-farm water management practices to reduce water wastage; and (ii) developing a database of all irrigation systems, including GIS mapping of existing irrigation and drainage networks and assessment of their functionalities which helps the municipalities and the ministries to manage irrigation and drainage assets and develop regular maintenance and rehabilitation plans. The agreed legal entity that will manage irrigation and drainage systems will be supported to develop: (i) an inventory of the irrigation and drainage assets that belong to the system including the precise blueprints of conducted works; (ii) a prototype agreement with farmers in order to ensure the participation of users in the decision making; (iii) the registries of land (plots) users, system users, and farmers which will be also regularly updated; (iv) the registry of office equipment including office premises, furniture, etc., owned by legal entity; (v) annual Irrigation Plan including irrigation schedule (daily/weekly) based on present situation on water needs and requests by users; (vi) guidelines for system operation, maintenance, and management; and (viii) modules for financial management, including invoicing and charging for water. The key output of the institutional development and capacity building component is Irrigation and Drainage Information Management Systems (IDIMS) both for the beneficiary municipalities and entities, which will be based on publicly available GIS mapping platforms. The development of IDIMS shall be assisted by a qualified consultant. In addition, capacity building activities such as provision of training, IT equipment, goods, etc., will be provided to WUAs, Municipalities, and managing companies. The total estimated cost of capacity building and institutional strengthening is BAM 1,242,000 (BAM 812,000 for FBiH and BAM 480,000 for RS). The project will only engage in irrigation systems for which cooperation and operations and maintenance arrangements have been agreed.

58. Under this component the labor-intensive civil works arrangements can be considered to support measures responding to the impact of COVID-19 on employment and incomes. Irrigation and drainage works can contribute to generating short-term employment opportunities for both skilled and unskilled labor. They can be traditional labor-intensive approaches, small enterprise intensive construction, inputs-for-assets programs and community contracting. The component will also closely collaborate and assure alignment with the EU-funded farm irrigation support that is currently providing matching grants for on-farm irrigation investments.



Irrigation schemes prioritization and selection criteria

59. Each irrigation scheme will be carefully tailored to the local water resources and hydrological conditions. In some locations, the water would need to be drawn from groundwater and in others from surface waters, or through conjunctive water use.

60. Implementation readiness is an important criterion given the unique processes involved in undertaking irrigation and drainage infrastructure development in BiH. There are complex approval, concession, and permit processes (e.g. preliminary water authorization, water authorization, water permit, urban approval, construction permit, electric power approval, electric power permit, etc.) involving numerous local, regional and entity government institutions before concluding an agreement with contractors.

61. The scheme selection criteria have been identified and agreed in consultation with the relevant staffs of the FBiH Ministry of Agriculture, Water Management and Forestry (MoAWMF) and RS Ministry of Agriculture, Forestry and Water Management (MoAFWM) (see Table 1 below). The criteria were carefully chosen to ensure that the selected irrigation schemes would significantly contribute to the project's overall agricultural competitiveness and resilience goals. The specific agreed criteria include implementation readiness of the schemes (i.e., availability feasibility studies, environmental and social due diligence reports, etc.); group or communal ownership to ensure equity in access to irrigation; willingness of farmers, municipalities and cantons to make financial contributions towards the scheme development costs; potential for diversifying towards economically remunerative higher value crops; minimum environmental and social footprints (i.e., avoiding physical displacement of people and encroaching into protected areas or sensitive environments). The municipalities and/or farmers are expected to contribute about 10-20 percent of the required budget for developing the main and secondary networks.

Table 1: Agreed Irrigation Schemes Selection Criteria

1.	Readiness for implementation including technical studies, estimation of economic rate of return, and environmental and social studies.
2.	Command area to be shared with a coefficient larger of equal to 5 independent farms (no single farm/cooperative investment) and in any case the proposed command area must be larger than 30 ha.
3.	50 % of the command area privately owned (not more than 50% state owned, except for the schemes that are developed for the purpose of research and education).
4.	The cost of building distribution network with open channel not larger than 2,500 EUR/ha and cost of building distribution network with pipe (pressurized or not) larger than 5,000 EUR/ha.
5.	Scheme development period (including licensing and permitting) not longer than 3 years and should be in operation at least for one season within the project closing date.
6.	No complex water intake structures (large reservoirs, dams, etc.).
7.	Confirmation of Municipalities willing to contribute at least 10% for less developed Municipalities and at least 15% for developed Municipalities (percent of the total project cost).
8.	Relevance of agriculture in the command area including high value crops demonstrate by Confirmation of farmers and system owner in willing to contribute to management of the water distribution schedule organized in WUA.
9.	Available data and relative readiness of schemes in terms of the required preparatory studies.
10.	Expressed demand from farmers for access to irrigation water. Confirmation from farmers that the under-supply of irrigation water is a constraint limiting their cropped area or yields in any season.



11.	Confirmation of the legal right to use water for irrigation already obtained (for identified source, licenses and permits and adherence to local and International agreements).
12.	Confirmation that the area is not included in regional or national plan to change the land use from agriculture to other uses. Confirmation that the land is not prone to urbanization in the intermediate and longer term.
13.	Confirmation the area is not part of a protected area or sensitive environment.
14.	Confirmation that no physical displacement occurs as a result of project induced involuntary land acquisition.
15.	No privately managed irrigation scheme.

62. The two entities vary in terms of availability of implementation ready irrigation schemes. FBiH has four implementation ready schemes (see Table 2 below) prepared as part of the IDP with a combined area of 424 ha and estimated cost of BAM 5,225,000 (EUR 2.7 million). There are 15 potential schemes to be considered for support under ARCP according to the agreed criteria, with estimated cost of BAM 28,275,000 (about EUR 14.5 million) for which feasibility and design studies are yet to be conducted.

Table 2: Priority Irrigation Schemes in FBiH

Name of Schemes	Area in Ha	Cost (BAM)
Investment Ready (Phase I) Schemes		
Bihać	87	500,000
Sanski Most	98	1,380,000
Živinice	70	890,000
Žepče	169	2,300,000
Sub Total	424	5,070,000
Supervision of works	NA	155,000
Total	NA	5,225,000
Proposed schemes requiring preparatory work (Phase II)		
15 irrigation schemes	2,465 (estimated)	28,275,000

63. RS proposes two priority and investment schemes with a total command area of 290 ha and an estimated cost of works of BAM 4,500,000 (about EUR 2.3 million) which are ready for implementation (see Table 3 below) and seventeen schemes with a combined irrigation area of 3,195 ha and an estimated cost of works of BAM 25,183,883 (about EUR 12.8 million), which are at varying stage of implementation readiness and require further preparatory/design work and prioritization (see Table 4 below).



Table 3: Priority Schemes in RS

No	Name of schemes	Area (ha)	No. of HHs	No. of Users	Cost (BAM)	
					Supervision	Works
1	Skelani	240	983	328	75,600	3,600,000
2	Aleksandrovac ²³	50	2	1	21,000	900,000
	Total	290	985	329	96,600	4,500,000

Table 4: Proposed schemes requiring preparatory studies in RS

No	Name of schemes	Area (ha)	No. of HHs	No. of Users	Cost (BAM)	
					Supervision	Works
1	Velika Obarska	90	-	50	27,000	900,000
2	Kojčinovac	553	-	313	165,900	5,530,000
3	Jablanica	160	69	69	38,000	1,280,000
4	Mašići-Vilusi-Osorna	1,000	350	350	240,000	8,000,000
5	Turjak	65	7	7	15,000	500,000
6	Sreflije	50	10	10	9,000	300,000
7	Demirovac (Demirovac locality)	250	20	20	9,000	300,000
8	Mrčevci-Kosjerovo	128	10	11	30,653	1,021,760
9	Borike	60	15	15	9000	300000
10	Meča (Opačica I)	49	50	200	10,290	343,000
11	Ljeljenča	150	-	200	36,000	1,200,000
12	Čađavica Srednja	150	-	200	36,000	1,200,000
13	Bratački lug (4 oblasti/4 spatial areas)	203	120	120	48,720	1,624,000
14	Bobetino Brdo	109	17	71	26,160	872,000
15	Štrpci, Uvac, Ekonomija "Uvac", Cikotsko Polje, Staro Rudo, Jelići	60	127	448	7,500	250,000
16	Tutnjevac	50	10	42	15,900	530,000
17	Čađavica MZ Gornja Crkvina	68	6	6	9,000	300,000
Sub-Total		3,195	811	2,132	733,123	24,450,760
Total: Works and Supervision					25,183,883	
Total: Feasibility, Design and ESF costs					1,375,000	
Grand Total					26,558,883	

64. For six out of the seventeen schemes requiring preparatory studies the cost of feasibility and design studies will be covered by the beneficiary municipalities. Importantly, the feasibility and design studies financed by the municipalities will be carried out under the supervision of the APCU and according to TORs satisfactory to the Bank, while the related ESF due diligence will be supported under the project. An amount of BAM 100,000 will be allocated under the project for ESF related costs for the schemes planned to be designed and prepared by municipalities. The cost of feasibility and

²³ This scheme is located in the experimental and educational center of the Faculty of Agriculture, University of Banja Luka and has been included exceptionally for extension and training purposes, although not fitting some of the agreed selection criteria.



design studies for the remaining schemes, which is estimated to be BAM 1,275,000, shall be covered by the project.

65. The above proposed irrigation and drainage schemes have undergone or will undergo (in case of newly proposed scheme) further prioritization and review to ensure compliance with the agreed selection criteria. Based on this screening process, and on the available allocation for the irrigation activities, a list of investments will be confirmed. In addition, about 15 percent financial contributions are expected from beneficiary municipalities to cover part of the capital investment costs.

Component 3: Enhancing Food Quality and Safety (EUR 9.80 million)

66. **Implementation of effective and efficient food quality and food safety policies and standards in BiH are essential to protect the consumers' health.** They are also fundamental in enabling BiH to assure safety and quality of food products for national and international trade, and to verify that imported or exported food products meet national and international requirements. BiH, as a trading country, is also required to officially verify that this responsibility is adequately met by the producers along the entire food production chain for feed and food of both animal- and non-animal origin. This would ensure modern, highly efficient, and profitable agri-food production which would facilitate trade while protecting consumers' health through access to high quality products. To achieve these enhancements, institutional arrangements and the BiH's state competent authorities' functions and responsibilities, in the food safety, veterinary and phytosanitary area across the agri-food chain (including border controls) need to be further strengthened.

67. **Furthermore, the COVID-19 pandemic has highlighted the need for BiH to increase its resilience to external and internal shocks.** This requires a fully functional chain of command and coordination and timely exchange of information. The key elements in this process are coordination and collaboration, risk assessment, laboratory capacity, crisis management and official inspection controls. They are vital for strengthening regulatory framework in decreasing and mitigating disease risks and increasing flexibility and efficiency in producing and marketing foods and providing more choice of safe food while fostering greater consumer confidence. While the effects of the COVID-19 pandemic are yet to be fully quantified in the BiH livestock sector and animal health, the pandemic has clearly demonstrated significant potential for severe impact on and disruption to food and feed value chains. This potential is reflected through reduced access to feed and food, inputs and services and access to markets with impact ranging from national (e.g. medium to large livestock enterprises) to international level (e.g. disruption in trade flows).²⁴ At the same time, the pandemic has also highlighted the importance of enhancing domestic plant production, health and protection as a component of BiH food safety when supply markets are severely disrupted.

68. Component 3 will build on previous achievements to support BiH in strengthening regulatory framework, ensuring flexibility and efficiency in producing and marketing foods, decreasing and mitigating disease risks and greater consumer confidence and more choice of safe foods. Component 3 includes two subcomponents: (i) Strengthening food quality and safety standards, and (ii) Information Technology (IT) Systems for Food Safety Enhancement.

Sub-component 3.1 Food Quality and Safety Standards (EUR 5.86 million)

69. Subcomponent 3.1 aims to support BiH to strengthen the food systems addressing quality and safety standards related to animal health protection, food safety and security and plant health protection with corresponding laboratories. The overall outcome is to achieve a high level of protection of animal plant health, human health and consumers' interests at all times both at BiH and EU and facilitate the effective functioning of the BiH and international (EU and other trading

²⁴ FAO, 2020. Mitigating the impacts of COVID-19 on the livestock sector. Rome. <https://doi.org/10.4060/ca8799en>



partners) markets.

70. The project will provide support technical and financial support to facilitate operational compliance with the EU General Food Law (GFL) Regulation (i.e. EC 178/2002), and a set of EU regulations (i.e. the Smarter Rules for Safer Food – SRSF)²⁵ for the risk-based protection from diseases and pests which relate to Animal Health (EU 2016/429), Plant Health (EU 2016/2031), and the EU Official Controls Regulation (EU 2017/625) on monitoring and enforcing inspection controls across the agri-food chain. These and other corresponding regulations constitute the backbone of the EU Chapter 12: Food Safety, Veterinary and Phytosanitary Policy. Significant enhancement of all those elements will also greatly contribute to the entire process of harmonization of BiH standards and requirements with relevant EU legislation related to animal health, food safety and plant health. These will also be in line with the relevant international organization agreements and standards, namely: World Trade Organization Sanitary and Phytosanitary (WTO-SPS) Agreement, World Health Organization and Food and Agriculture Organization (WHO/FAO) Codex Alimentarius, World Organization for Animal Health (OIE), Terrestrial Animals and Aquatic Codes, and International Plant Protection Convention (IPPC). This will also support BiH with meeting internationally recognized food certification requirements, such as GlobalGAP, EurepGAP, HACCP, etc.

71. In terms of BiH legislation, the project will build on previous achievements of the EU and other donors funded support for animal health and food safety risk management and developing food safety and quality standards. The project's technical and financial assistance will build on capacity building funded by EU IPA programs through EU Twinning projects which have been initiated in late 2020 and have a strong focus on harmonization of BiH legislation with relevant EU legislation in food safety, animal health, plant health and official controls. In this context, the project's focus will be on coordination and collaboration with the EU Twinning programs and other relevant donors funded projects in food safety, animal health and plant health to ensure complementarity and build up on synergies.

72. The project's specific focus will be strengthening sector-specific laboratory capability and capacity. One of the key official control assurances to be achieved is compliance with the EU Official Controls Regulation (EU 2017/625) which outlines the requirements for laboratory capacity and capability and technical requirements for laboratory testing for official control purposes. The project's specific activities will focus on institutional building through purchase of specific laboratory equipment in order to introduce or expand quantity and quality of laboratories performance as regards animal health, plant health and food safety (especially where it concerns residues of certain substances such as Pest Protection Products or other chemicals, microbiological and mycotoxins) in foods of plant and animal origin. The adequate and officially controlled laboratory testing is the final element of the entire process for assuring that food and feed, which are supplied to the market, are safe. It is therefore essential that the entire process of food and feed production and marketing is subject to specific monitoring which includes laboratory testing and analyses. This will primarily result in (i) exclusion from a market food and feed, and (ii) much higher awareness of farmers and other operators when introducing and implementing the specific production and processing practices.

73. The project will strengthen the capacity at the BiH level which will considerably contribute to the building up of the BiH's integrity and common interest while facilitating national markets and international trade. Project outputs and outcomes are highly sustainable and will facilitate BiH's access to new markets, including the EU markets. Regular monitoring at BiH's country-wide level will also cover all segments of agriculture production, including smallholder

²⁵ Smarter Rules for Safer Food – SRSF:

- Animal Health Regulation (EU) 2016/429: a framework for the principles of European animal health – applies from 21 April 2021
- Plant Health Regulation (EU) 2016/2031: controls for protecting plants from disease and pests – applies from 14 December 2019
- Official Controls Regulation (EU) 2017/625: how controls across the agri-food chain will be monitored and enforced – applies from 14 December 2019



farmers, which should provide for much higher level of food and feed security

74. The project's technical and financial assistance will support the sustainable effective and efficient network of BiH official laboratories who handle the approved methods to be adapted to the analytical needs required. Overall, in animal health and food safety and plant health, there is a need to improve processes for defining and approving adequate National Reference Laboratory(s) (NRLs) infrastructure at BiH level to maximize the use of the existing capacities and capabilities and to avoid potential for duplication. Specifically, there is a need to develop specialization within the laboratory system, to facilitate the development of expertise in the individual laboratories which would serve as NRLs for specified animal health, food safety and plant health testing. In animal health, it will focus on strengthening laboratory input in implementing strategic risk-based epidemiological studies based on animal identification and movement control activities. In food safety, it will focus on laboratory monitoring to support effective institutional supervision over production, processing and marketing. In plant health, this will be a considerable diagnostic support for inspectors involved in visual examination of cultivated plants, or plants or plant produce internationally moved.

75. The overall result would be in ensuring consolidated focus of the existing laboratory networks (e.g. by grouping networks with similar areas of expertise) and harnessing relevant technological improvements, the need to choose the coordination options most suitable in specific cases, and the need to provide sustainable funding, including for emergency situations (such as contagious animal diseases and those with zoonotic and pandemic potential such as COVID-19, or plants pests and diseases, or sanitary threats to humans and animals). These will provide improvements to risk-based national surveillance and disease/pests control programs to ensure that only safe products are produced and available to the consumers. The EU Regulation 2017/625 outlines a requirement to have a multi-annual national control plan (MANCP) to ensure that country-wide, comprehensive, effective and risk-based control systems are in place for monitoring and enforcing feed and food law, animal health and animal welfare rules, and plant health law. The MANCP preparation also requires that a specific body is designated to develop the risk-based inspection control strategy and ensure cooperation and collaboration of all sector-related competent authorities in development and consistent implementation. Among other requirements, official controls and monitoring include laboratory analyses which are handled by 'official laboratories' using approved methods and tests. It will also support the standardized official oversight and inspections and accuracy of relevant certifications and cross-border cooperation with relevant EU reference laboratories and European Commission and European Food Safety Authority. Overall, this will increase BiH's compliance with EU requirements for official controls, export certifications and trade.

76. The project will support successful implementation of good agricultural practices from smallholders to industry organizations along the value chain combined with regular official laboratory and inspection controls. This should result in on-going and sustainable reduction of the use of Plant Protection Products and other chemicals, which will have a positive effect on the environment.

77. In both animal health and food safety the project's technical and financial assistance will also focus on required technical and logistics support related to official laboratories' additional training and study visits that may not be provided through EU Twinning or other donor funded programs, research studies, inter-laboratory comparison testing, including improvements relevant to equipment/tests/reagents and to laboratory facilities (e.g. renovating/upgrading). The result would be in standardized application of the official requirements and improved accuracy of records for strategic planning and implementation purposes.

78. The official laboratories are responsible for constantly keeping the available analysis methods up to date and for efficient and effective collaboration with competent authorities. They also are required to take part in inter-laboratory comparative tests as requested, and a list of names of the approved methods for performing analyses, tests or diagnoses



for official control purposes. The project's technical and financial assistance will support the review of approved methods and tests and public availability (in cooperation with competent authorities). It will support the establishment of appropriate laboratory capacity and capability for a range of tests and pilot testing of selected approved tests and methods through selected studies and inter-laboratory comparison testing.

79. The results would be in timely prevention and detection of contagious animal diseases and zoonoses and food and feed safety related. It would provide for capacity building, science and research-based evidence support to animal health, food safety and plant health services and related policies in protecting animal health, food security, plant health and public health while facilitating trade as a part of sustainable socio-economic development.

80. Whenever appropriate, the project will support the BiH's preparations related to purchase and installation of laboratory equipment. All these activities require financial resources and monitoring and evaluation of results to ensure successful operationalization. The table below specifies crucial steps to be achieved in a specified timing. Adherence to the schedule will ascertain that the project's objectives are fully met by project completion.

Table 5: Monitoring and evaluation of results

Outcome	Output (result) indicator	Timeline	Comment
Improvement of laboratory capacities	Tender documentation prepared, including the equipment specification	By project effectiveness	The specification of the equipment shall be, on one hand, detailed and precise, on the other hand – shall not indicate any specific provider, so that the rules of fair competitiveness are observed
	Equipment purchased and housed	Within 4-12 months from project effectiveness	It is necessary that the beneficiary provides all necessary conditions for the equipment housing: proper premises, gases installation, air conditioning, etc. – requirements of the equipment provider shall be taken into account
	All necessary supplementary equipment purchased and housed	In parallel with the equipment installation	The beneficiary shall purchase all necessary devices and equipment which are needed for implementation of laboratory techniques related to the use of the procured chromatographs
	Methods of analyzes implemented	Within 1-1.5 year from project effectiveness	Any other needs related to the implementation of the analytical methods (i.e. residues, chemicals, microbiological, somatic cell count, reagents, training,) recognized and successfully completed; methods to be implemented and validated; preferably the laboratories shall participate in proficiency tests
	Laboratory analyzes started	Approximately after 1.5 year from project effectiveness	National system of sampling and samples delivery developed, including specific sampling calendar in order to avoid accumulation of a high number of samples delivered to laboratories at the same time
	National reference laboratory(s) designated	In parallel with other activities	Of functioning laboratories, one shall be designated as the NRL in food safety, animal health and plant health, which would serve as a reference and verification laboratory(s) for all the other sectoral



Outcome	Output (result) indicator	Timeline	Comment
			laboratories
	Accreditation of laboratories and or methods awarded in food safety, animal health and plant health	In parallel with routine operation of the laboratories	Time as well as human and financial resources need to be reserved for all activities related with preparation towards the process of accreditation of laboratories and/or laboratory methods

81. **Achievement of the project's development objective require anticipation of keys risks and corresponding mitigation measures.** The table below summarizes the main risks that can be anticipated, along with their ratings and proposed mitigation measures.

Table 6: Risk ratings summary table

Description of the risk	Risk rating	Mitigation measures	Residual risk rating
Lack of proper facilities for installation of the equipment	S	All the existing facilities shall be assessed well in advance before the procurement procedure starts; in case of any needs certain investment shall be done (this means that additional BiH finances need to be dedicated)	S
Insufficient number of laboratory staff	S	The management shall well in advance identify all staffing needs and, whenever necessary, employ relevant laboratory staff (this means that additional BiH finances need to be dedicated)	M
Lack of supplementary equipment, chemical, reagents, test kits.	M	All needs shall be recognized well in advance and completed (this means that additional BiH finances need to be dedicated)	L
Designation of the national reference laboratory(s) in food safety, animal health and plant health	S	Due to the political situation in BiH, this goal may be hard to achieve; the World Bank shall facilitate discussion on this issue, including providing certain expertise and scientific opinion on the level of the laboratories' competence	L
Process of accreditation of laboratories and/or laboratory tests in food safety, animal health and plant health	S	Good support from the management, including designation of special human and financial resources; the World Bank can leverage the authorities to step up with accreditation activities	L
OVERALL	S		M

H – high; S – substantial; M – moderate; L – low

82. Overall risk rating explanation. Preparatory activities on the BiH side will be required in advance of purchase and installation of equipment to be provided under the project. Certain equipment, such as gas and liquid chromatographs, needs to be installed in specifically designed rooms with necessary gas installation, and this will require some investment to be done by BiH. Furthermore, there might a need for purchase of a number of principal or supplementary equipment



to ensure smooth samples collection, testing and analysis – this must be done well in advance. If the current level of staffing is not sufficient, additional employees may need to be contracted. All these activities will require some financial resources on the BiH side which should be included in the budget. Failing to set aside the required financing will cause a high risk for ensuring successful installation and operation of equipment.

Sub-component 3.2 – Information Technology (IT) Systems for Food Safety Enhancement (EUR 3.94 million)

83. Sub-component 3.2. will focus on ensuring compliance with the EU Official Controls Regulation (EU 2017/625)) which provides for functional simplification and alignment of BiH official controls and harmonization of procedures and standards through the EU established new computerized system (i.e. EU – Information Management System for Official Controls - IMSOC). The IMSOC has been designed to integrate and unify all existing and future EU computerized systems which function in the veterinary, food safety and plant health (e.g. TRACES, RASFF, EUROPHYT) to more efficiently manage data, information and documentation on official agri-food chain controls in relation to risks and hazards to animal health and welfare, food safety and public health, and plant health.

84. The EU Official Controls Regulation (EU 2017/625) requires national authorities to apply risk-based official controls in agri-food chain (i.e. production, processing, distribution and use, registered food operators) while minimizing burden on operators and potential for fraudulent practices. It also provides for deregulation of control activities and clear roles and responsibilities of competent authorities and delegated body(s).

85. In this context, this sub-component will finance development and upgrading of IT software and hardware systems that are critical for improving Food and Feed Safety Standards in the country. The BiH and FBiH level relevant institutions will be supported to develop reliable IT systems which will be used in developing and implementing in practice food safety standards in line with international best practice. Furthermore, developed IT systems will be used to effectively monitor food safety standards application in practice by different institutions of BiH and to report on non-compliances, to be compatible with EU IT systems.

86. In food safety, the EU General Food Law (GFL) Regulation (EC 178/2002 and relevant updates) covers general principles, definitions of safe and unsafe foods, traceability requirements (i.e. food, feed, food-producing animals, any substances intended to be incorporated into a food or feed), risk analysis (i.e. risk assessment, risk management, risk communication principles and role of EFSA) and precautionary principles (i.e. RASFF, emergency measures and crisis management). It sets the framework for policy implementation and decision making at all stages of food and feed production, processing, storage, distribution and transport, and retail sale, including procedures and tools for international and EU notifications and application of precautionary principles. It also places requirements on food business operators (FBOs) which hold the primary legal responsibility for ensuring compliance with the GFL. FBO's must also ensure that products comply with specific EU provisions on safety. These include the regulations related to setting up maximum levels for certain contaminants and residue levels of pesticides in food for placing on the market. An FBO must not place food on the market if the levels are exceeding the maximum specified levels.

87. Accordingly, the BiH Food Safety Agency (FSA) as the competent food safety authority is expected to ensure effective and efficient transposition of EU requirements to national food safety legislative framework and implementing mechanisms. As required by the BiH Food Law (2004) ("Official gazette B&H", No. 50/04), FSA has been established with responsibility for providing risk analysis (assessment, management and communication of risk), and initiation, preparation, drafting and proposing regulations on food, including other related tasks in food safety. FSA is also the national contact point for EU RASFF and WHO/FAO INFOSAN.



88. BiH FSA considers that the current collection of data in an aggregated format does not allow for comprehensive statistical analyses and is of limited value for quantitative exposure and risk assessment. There is a need for data to be collected in an individual, sample-based which should allow for more detailed evaluation at matrix and substance level. Accordingly, the FSA is expected to ensure effective and efficient transposition of EU requirements to national food safety legislative framework and implementing mechanisms facilitating production of food and trade.

89. The project will provide technical and financial support for a well-designed BiH FSA IT system with incorporated methodology (i.e. Standard Sample Description – SSD2,²⁶ EFSA FoodEx2²⁷). This would provide for further upgrades to BiH FSA risk assessment module and subsequent development of guidelines, training, study visits, pilot testing and simulations which would significantly improve the BiH FSA's ability to provide answers to several questions in relation to the risk assessment and risk management. The BiH FSA has specifically identified the need to improve risk assessment module as an integral component of the Food Safety Information System (FSIS). This would also require amendments to the existing Food Law to consider legal and by-law obligations for identified sources for submitting data to FSA at BiH, Entities (FBiH, RS) and the District Brčko level.

90. The project's technical and financial support to BiH FSA will focus on enabling the platform for effective discharge of legal obligations through functioning risk assessment component as an integral part of supporting the two other two key components of risk analysis (i.e. risk management and risk communication). To achieve this, the project will enable prioritization of public and stakeholders' engagement in provision of scientific advice, extending the risk assessment capability and strengthening knowledge management to prepare for future risk assessment challenges.

91. These challenges may arise from a food safety hazards perspective or in combination with national disasters or new and emerging zoonotic diseases or emergence of pandemics such as COVID-19 or with similar potential for rapid spread and causing significant national and global health and economic disruption and trade. In food safety in BiH these effects could relate to reduced processing capacity, compromised storage and conservation and constrained informal businesses (e.g. meat and dairy processing) as well as transport disruptions, and changes in sales and consumption demands. The sub-component will support provision of fit-for purpose and independent scientific advice to policy and decision makers related to food and feed safety, animal health and welfare, nutrition, plant health and related environmental aspects and influences. It will set the platform for collaboration with cooperating EU institutions such as EFSA and food safety reference laboratories to promote standardized terminology, methodology and advice related to identification, characterization and monitoring of specified food and feed safety hazards. It will also strengthen communication with public, farmers, industry and associated value chains in an open and transparent manner, and prevention of fraud practices while facilitating trade, jobs creation, social wellbeing and economic development. These engagements would include joint training, study visits, pilot testing and simulation exercises.

92. The results will be reflected in setting up a foundation for the interplay between science, risk assessment and risk management. This has always been a complex area which is also increasingly characterized by rapid technological innovations and processes, novel communication ways and public demand for input into policy and decision-making. The benefits will be in enabling more defined, contextual and socially sound risk assessments while maintain scientific robustness. It will also ensure effective and efficient interdisciplinary (i.e. cross-sector) linkages to relevant sectoral capacity and capability and databases (e.g. animal identification and traceability, public health, environment health) and provide complementary perspective to future cross-disciplinary risk assessments for food safety and consumer

²⁶ EFSA (2019). Reporting data on pesticide residues in food and feed according to regulation (EC) No 389/2005 (2018 data collection). EFSA Journal, 8 March 2019, doi:10.2903/j.efsa.2019.5655, p72.

²⁷ EFSA (2015). Technical report: The food classification and description system FoodEx2 (revision 2). EFSA, Published 30 April 2015, p90.



protection purposes.

93. In this context, the project's focus will also be on coordination of its activities with the EU Twinning and other donors funded projects to ensure complimentary. It will support reporting of key findings to establishments, encouraging compliance and preventing non-compliance, and actively facilitating good practice, functional liaisons and communication through pilot testing and simulation exercises. The benefit will be in ensuring and promoting consistency in the application of the inspection program and increasing resilience to shocks (e.g. COVID-19 pandemic, disaster risk management) while improving animal health and food safety and sustainability across agri-food sector. This would contribute to BiH competent authorities is meeting the set targets for the planned inspection program and ensuring improvements to benefit the authorities, stakeholders and general public and research and scientific community.

94. The Veterinary Office of BiH (VOBiH) as the competent animal health authority is expected to ensure effective and efficient transposition of EU requirements to BiH's animal health and welfare legislative framework and official controls implementing mechanisms. The project's subcomponent 3.2 will provide support to VOBiH to strengthen the IT software and hardware system that is critical for improving the BiH's food safety standards. The overall outcome is to achieve a high level of compliance with national and EU legislation related to animal health and food safety to facilitate effective and efficient monitoring, inspections, controls and reporting in agri-food chain. It would ensure on-going protection of animal and human health and consumers' interests and facilitate the effective functioning of the national and international (EU and other trading partners) market.

95. The overall output in animal health and food safety is to support the VO and FSA in upgrading and functional harmonization of the related IT systems (e.g. animal health, laboratory, food safety, plant health) at BiH level and standardized implementation supported by both BiH Entities (FBiH and RS) and the Brčko District. This would ensure consolidated functional links which would significantly increase risk assessment capability.

96. In animal health, the project will provide technical and financial support to VOBiH for modernization of the Data Centre Central System to ensure for processing, redundancy, availability and backup of all data and support to other applications, such as Veterinary Information System (VIS), ADNAOM-IS and Active Directory, Domain Controller, System Center Configuration Manager and Document Management System. It will also provide for defining functional requirements for linking federal, cantonal, municipal systems with authorized inspections (including borders) and testing laboratories modules. It will also provide for ensuring connectivity and functional inter-operability with other relevant IT systems at BiH level (e.g. VIS, FADN, Unique Farm Register (UFR), LPIS. At the RS level, it will provide for defining improvements to the existing border inspection module and planning and risk assessment module and their inter-operability with other relevant modules and functional connectivity with VOBiH systems. The result would be in ensuring connectivity and functional inter-operability with relevant IT systems in animal health. This would include development of administrative arrangements, guidelines, and joint training, study visits, pilot testing and simulation exercises.

97. The BiH specific request for plant health concerns upgrade of the Phytoregister, a system which originally has been developed for the purpose of registration of official controls concerning plant health controls, including issuance of plant passports. Such a system was already developed within the ARDP project, and a specific software was acquired and installed. However, this system needs upgrading, including incorporation of issues related production of seeds and planting material, so that plant health issues get close association with seed production and will include elements of risk analysis. It is planned that the system will be country-wide used, meaning that Competent Authorities of all entities will enter the relevant data. This shall provide a comprehensive electronic database which would contain all information necessary for proper supervision of plant health and seed production issues. Besides, such data shall be easily accessible for all authorized persons (e.g. inspectors, decision making officials, laboratory staff, etc.), and this should provide an



additional guarantee that all rules are observed. It is also planned that such this system will include a module for submitting applications for protection rights of breeders as well as modules for transferred breeder's right, register of the contractual licenses, register of the agents and register of protected plant varieties.

98. Effective implementation of the IT systems requires relevant institutional and operational arrangements to be in place on the BiH's side. The latter include high-speed internet connections, protection against unauthorized entries, corrections of mistakes made by users, etc. In addition, all necessary hardware, such as servers, computers, etc. will be required. For those IT systems which already exist and are used, a number of these arrangements will only need upgrade and extension. This in particular concerns central servers which shall have much higher capacity. Once the installation of the relevant software is completed, there will be a need for training of all potential users.

99. The upgraded system shall provide options for any future connections with external systems, such as systems of other countries and internationally developed systems, including those of the EU (e.g. TRACES, IMSOC, EUROPHYT) and, for plant health, the e-phyto hub, a system developed by the International Plant Protection Convention (IPPC) to facilitate trade amongst countries by the use of electronic phytosanitary certificates. The upgrades will be a great step forward as regards the use of modern technologies in daily inspection works. It will also create sound grounds for any future development of electronic databases. With options to get connected with internationally developed systems, such as IPPC's e-phyto hub, EU's system TRACES, EUROPHYT and IMSOC, it will provide excellent grounds for easy data transmission, thus will greatly increase opportunities of BiH for international trade of plants and plant products, including seeds and other propagative material.

100. Existence of modern electronic databases will be also a good incentive for young people to join veterinary, food safety, phytosanitary and seed inspection services. Maintaining data in electronic form, including issuance of certain documents in electronic versions, will have a positive effect on environment (less paper used). Availability of plant health and seed production country-wide data in electronic database, will represent a great source for any queries, reporting, statistics and reviews, and this shall considerably help decision making in planning and financing activities, thus will be a great support for the management.

101. Finally, use of such a system, along with other modern communication devices (e.g. mobile phones, portable PCs, etc.) shall lead towards, whenever possible, exclusion or significant reduction of direct contacts with farmers and other operators. This is particularly important in the COVID era as certain control activities can be arranged on-line or by phone, and certain documents, such as inspection reports, certificates, laboratory results, etc. can be issued, stored, and transferred electronically.

102. The project, in a synergy with ongoing EU Twinning projects, will support the BiH's preparations related to purchase and installation of hardware and development of IT systems. All these activities require good planning, management and coordination. The need for dedication of additional BiH financial resources cannot be excluded. It is therefore necessary to monitor and evaluate implementation steps to ensure successful operationalization. The table below specifies crucial steps to be achieved in a specified timing. Adherence to the schedule will ascertain that the project's objectives are fully met by project completion.



Table 7: Monitoring and evaluation of results

Outcome	Output (result) indicator	Timeline	Comment
Upgrade of the phytosanitary IT system	Analysis of the current IT system accomplished	Within 3 months from project effectiveness	Define the operational capacity of currently used IT system, including the relevant hardware and conditions of its maintaining (especially central servers) – common work of officials and IT experts
	Assumptions of the upgrade discussed and agreed	Between 4-6 months from project effectiveness	Define future operational characteristic of the upgraded system to meet expectations of seed production area, including design of relevant modules – common work of officials and IT experts
	Relevant software installed	Between 7-9 months from project effectiveness	IT experts
	The upgrade tested	Between 9-12 months from project effectiveness	IT experts shall arrange for testing the upgraded system on various levels of its use (i.e. field inspectors, laboratory, central staff, etc.), to identify gaps and errors in the system and to correct those
	Training of users carried out	In parallel with the system testing	IT experts shall organize series of training courses for all potential users; a kind of on-line guideline and presentation on the use can be considered to reduce costs
	System in use	After 1 year from project effectiveness	The system shall become available for all potential users and shall allow for daily use, at all levels of operation
	Monitoring of use, any errors found corrected, etc.	Regularly during the use of the system	Users shall notify any errors to the IT experts and those errors shall be fixed

103. **Achievement of the project's development objective require anticipation of keys risks and corresponding mitigation measures.** The table below summarizes the main risks that can be anticipated, along with their ratings and proposed mitigation measures.

Table 8: Risk ratings summary table

Description of the risk	Risk rating	Mitigation measures	Residual risk rating
Currently possessed servers are not sufficient for the upgrade of the software	S	The capacity of the existing servers shall be assessed and, if there is a need, new hardware shall be purchased (this means that additional BiH finances need to be dedicated)	S
IT experts, especially familiar with the subject matter, not available	M	The World Bank can assist in seeking IT professionals in other countries from similar institutions	M
OVERALL	S		M

H – high; S – substantial; M – moderate; L – low



104. **Overall risk rating explanation:** the main problem might be with the central servers – in case its operational **capacities** are not sufficient to manage with the upgrades, this would mean the need for their extension, thus some investments. In the absence of additional financial resources this may stop or delay the entire process of the upgrades.



ANNEX 3: Project Costs

COUNTRY: Bosnia and Herzegovina
Agriculture Resilience and Competitiveness Project

Project	Loan amount (EUR millions)	Project costs (EUR millions)			Loan by entity (EUR millions)	
	IBRD	BiH	FBiH	RS	FBiH	RS
Component 1	8.44	0.88	4.07	3.49	4.51	3.93
Sub-component 1.1	5.46	0.88	2.64	1.94	3.08	2.38
Sub-component 1.2	2.98	-	1.43	1.55	1.43	1.55
Component 2	40.43	-	19.07	21.35	19.07	21.35
Sub-component 2.1	6.65	-	2.51	4.14	2.51	4.14
Sub-component 2.2	33.78	-	16.56	17.21	16.56	17.21
Component 3	9.80	2.13	4.62	3.05	5.69	4.12
Sub-component 3.1	5.86	-	2.82	3.05	2.82	3.05
Sub-component 3.2	3.94	2.13	1.80	-	2.87	1.07
Component 4	2.73	0.14	1.36	1.23	1.43	1.30
Total	61.40	3.15	29.12	29.12	30.70	30.70



ANNEX 4: Economic and Financial Analysis

COUNTRY: Bosnia and Herzegovina Agriculture Resilience and Competitiveness Project

1. This Annex presents the methodology for the economic and financial analyses (EFA) that will be conducted to assess the impact and viability of the various activities envisaged under the project.

Project development impact and economic benefits

2. The Project will have tangible socio-economic benefits, inter alia:
 - (a) increased agricultural production thanks to productivity enhancement, expanded cultivated area under improved irrigation and drainage practices, and facilitated access to markets;
 - (b) reduction of post-harvest losses at field level and along the targeted value chains;
 - (c) water savings and increased water productivity (both in physical and monetary terms);
 - (d) increased share of production that is sold and generates monetary revenues, particularly for smallholders;
 - (e) increased average producer prices and greater share of benefits accruing to producers thanks to strengthened producers' organizations, market promotion activities, linkage of smallholders with markets and traders (national and export markets), and enhanced technical and managerial capacity of producers and value chain actors and their organizations;
 - (f) enhanced access to value chain finance services including matching grants, investment grants and financial services offered by national financial institutions;
 - (g) strengthening, formalization and expansion of existing informal productive and commercial partnerships between smallholders and value chain actors involved in: bulking of production; agricultural input supply; trade, storage and processing of agricultural products;
 - (h) shift to more sustainable land and crop management practices, including adoption of globally acknowledged Good Agricultural Practices (GAP) and Integrated Pest Management (IPM);
 - (i) increased resilience of producers and local markets to climate change impacts and adoption of Climate-Smart Agriculture (CSA) and climate-resilient practices and technologies;
 - (j) improved quality of targeted agricultural products;
 - (k) expanded market opportunities (notably for export to EU and beyond) offering higher and more stable prices and increased volumes, thanks to legislation adaptation, compliance with international standards and processes and capacity building of producers and value chain actors;
 - (l) improved food safety benefiting both producers and consumers, and subsequent reduced occurrence and severity of illness caused by food poisoning, zoonotic diseases, residual content in food products (toxins, heavy metals, etc.) and improved plant and animal health and soil health;
 - (m) additional employment generated at both farm and off-farm level and down the value chains;
 - (n) increased incomes of direct and indirect beneficiaries;
 - (o) reduced greenhouse gases emissions; and
 - (p) increased fiscal revenues resulting from higher turnover of targeted smallholder farmers, agricultural production SMEs and value chain actors/SMEs (including cooperatives if any).



3. Some of these benefits can be quantified such as:

- (i) increased net incomes, value-added and income diversification derived from financing sub-projects through matching grants granted to value chain actors for pulling smallholders' production (sub-component 2.1.);
- (ii) increases in agricultural production and incomes and environmental benefits derived from modernization of irrigation and drainage infrastructure and technology, capacity building of irrigators and improved governance in targeted irrigated schemes (sub-component 2.2); and
- (iii) the value of net GHG emissions reduction.

4. Activities under components 1 and 3 are well identified in scope and nature; however, their potential benefits are mostly non-quantifiable. Most project benefits will be derived from irrigation improvements and from productive partnerships sub-projects both funded under component 2; productive sub-projects being strictly financed on a demand-driven basis. Forecasting and quantifying benefits of the later benefits is thus difficult.

5. Sub-projects models should, to the extent possible, present a range of the likely investments in the targeted value chains that aggregators might propose to ARCP co-financing. However, they proved to be difficult to elaborate through distance and virtual talks with difficulty to gain trust from potential aggregators/investors to share actual and accurate business and financial information. Sub-projects/matching grants calculations should also be considered as estimates as, according to the participatory planning and bottom-up approach adopted by the project, the sub-projects will be strictly demand-driven thus there are limitations to estimate precisely what they might turn to be. In addition, some of the above benefits may materialize in a gradual manner and, sometimes, beyond the 5-year project implementation period. Therefore, it is difficult to transform these into indicators to track down project progress and impact in the Results Framework. Nevertheless, production before project start and assumptions for crop/activity/farm models/production/income increases should be assessed during the baseline studies and/or detailed design studies (carried out for each irrigation scheme) and the preparation of business plans of each sub-project, and tracked down accordingly in order to recalculate the benefits at the project completion stage.

6. The project will also generate benefits of a less tangible nature that are difficult to quantify, amongst which:

- (a) conservation of ecosystems, habitats and biodiversity;
- (b) reduction in water and post-harvest losses;
- (c) enhanced food safety and nutrition security of targeted households, producers and consumers at large;
- (d) improvement in water and air quality, improved health of producers and consumers and of their life expectancy;
- (e) increased life period of irrigation schemes as a result of improved management and governance of the later;
- (f) longer term multiplier effects of strengthened capacities of producers/actors and value chain organizations;
- (g) reduced asymmetry of technical and market information between value chain actors; and
- (h) reduced vulnerability to external shocks (notably climate change and instability or decrease of food prices) and thus enhanced resilience and sustainability of production systems.

7. These benefits are less amenable to quantification, but they can be considerable, and have the potential to play a major role in reducing inequities and tensions and improving social stability and prosperity in the project intervention areas.

8. It should be noted that the economic and financial analyses only took into consideration tangible benefits (either precisely specified or estimated based on hypotheses). Results of the analyses are therefore purposely conservative.



Financial analyses

9. Financial analyses were conducted to estimate the ex-ante feasibility, risks and returns of the productive and economic activities and investments supported under subcomponents 2.1 and 2.2 for which models could be elaborated. It aimed at assessing:

- (a) the attractiveness and viability of typical sub-projects/business plans for investments in targeted value chains from their beneficiaries (aggregators) view point, in terms of the increased net cash income likely to accrue to them²⁸;
- (b) the attractiveness of proposed irrigation improvements to participating smallholders (in terms of additional agricultural income it may generate based on crop, farm and irrigation scheme models with assumptions for increases in yields, changes in cropping pattern, land use, market orientation etc.) with access to improved irrigation infrastructure and technologies thanks to the ARCP support; and the likely viability at scheme level to ensure a sustainable use and maintenance of the scheme; and

Value chain development / Matching grant scheme (sub-component 2.1)

10. The ARCP will support economic actors to upgrade value chains and pull agricultural production and quantitative and qualitative improvement in selected value chains e.g. fruits and vegetables, dairy and red meat (cattle)²⁹ through the provision of matching grants to co-finance viable subprojects promoted by value chain actors. Matching grants would be provided to aggregators³⁰ as they play a key role in market linkage based on their knowledge of buyers' expectations, provide smallholders outlets for their production, have the capacity to train producers and improve the quality of their products, and to impose food safety standards and/or good agricultural practices. The enabling/pulling role of aggregators will subsequently result in an improvement of the competitiveness of the entire target value chains, for the benefit of both participating producers and aggregators themselves.

11. Indicatively, the matching grants scheme will target a total of 51 aggregators and 1,700 smallholders (of which 20 percent women and youth): a) in RS: 30 aggregators and 1,050 smallholders; and b) in FBiH: 21 aggregators and 650 smallholders. A total IBRD funding of EUR 6.7 million is set aside for this subcomponent. Targeted Technical Assistance (TA) will be provided to build the knowledge and capacity of participating aggregators/farmers in the field of business plan preparation, compliance with market requirements, technology transfer/improving livestock and horticultural productivity, quality enhancement, reaching international standards for certification (Global GAP), as well as accompanying the implementation of each sub-project, conducting an awareness campaign and elaborating and publishing associated communication material. Such TA will be provided by national and international service providers (NGO, consultants, universities, partnership or consortia of such entities). TA costs were estimated at around 10 percent of the matching grant element equivalent to EUR 0.65 million.

²⁸ Assessing the effective possibility for existing potential aggregators to actually participate in co-funding the sub-project (a minimum cash contribution of 35 percent of the sub-project investment costs will be required from their promoters/grant applicants); and likelihood to attract funding from national financial institutions to cofinance part of the sub-project promoter's own contribution to meet (partly or fully) the sub-projects' investment costs as well as the working capital requirements through short and medium-term credit or possibly seed capital

²⁹ With focus on fruits and vegetables, dairy products and meat (cattle) subsectors in RS; and to fruit and vegetables and dairy products for FBiH.

³⁰ Eligible aggregators to the ARCP grant scheme will be any business entity handling and/or procuring agricultural products of the target value chains, which directly cooperates and/or links with producers and provide them with input supplies, technical advice, marketing services, bulking/storage facilities, market intelligence, value chain financial services, etc. (i.e. private collection centers and agro-processors, cooperatives, duly registered clusters/associations of producers, etc.).



12. By essence, the sub-projects funded by the ARCP under this subcomponent will be driven by demand. Therefore, it is difficult to elaborate representative and typical models of sub-projects/business plans that could adequately reflect the possible viability of investments that value chain aggregators would propose to ARCP funding.

13. ***Fruit and vegetable bulking and marketing cooperative Model.*** An indicative cash flow for a potential fruit and vegetable bulking and marketing subproject was elaborated after discussing with an agricultural cooperative in the southern part of FBiH that recently embarked in such activity. The cooperative currently has about 300 members and operates in a very productive area where exist an irrigated scheme and fruit and vegetables production is well known (yearly production of cooperative members estimated at 7,000 tons of early potatoes; 2,000 tons of watermelon; 800 tons of spring onions; and 100 tons of garlic, just to mention their main products). The cooperative is currently bulking and marketing just a small share of the production of its member (70 tons; BAM 0.04 million of sales in 2020) due to limited storage and marketing network. It just benefitted from matching grants from both the municipality and an IFAD-funded project (BAM 0.8 million in total) to invest in a 600 m² warehouse (300 tons capacity) in a strategic location, which construction is ongoing; purchase of small equipment (forklifts, etc.) is planned to happen soon from the cooperative own resources (BAM 0.06 million). The cooperative is forecasting to increase its activity to 100 tons in 2021 (BAM 0.1 million of sales) and reach 1,750 tons (BAM 1 million) within three to four years. The model is based on applying a minimal deduction on sales (estimated at 10 percent) to cover the operational costs (operation and management staff, management, bank and bookkeeping costs, utility charges, annual maintenance cost of warehouse and equipment etc.) in order to maximize the redistributed share to cooperative members. On that basis, an indicative cash flow showing the current “without project” and “with project” situations was elaborated over 15 years (see Appendix). It shows positive financial results: (i) the cumulative cash flow in the “with project” situation is regularly growing and allows the meet the operational costs as well as the cost for replacing the small assets at the end of their life period (after ten years); (ii) the financial rate of return (FRR) before financing the investment (7 percent) is above the financial cost of capital (4 percent); (iii) considering the received financing, the FRR establishes at 93 percent; and (iv) the incremental economic internal rate of return (taking into consideration the incremental cash flow before financing between the “with project” and “without project” situations) is estimated at 4 percent meeting of and a cumulative cash flow that allows to meet the operational costs and the replacement of assets.

Irrigation Improvement (sub-component 2.2)

14. The ARCP would support: (a) the upgrade and modernization of 6 schemes (4 in FBiH and 2 in RS) that were studied in detail by the IDP (see below); and (b) the upgrade of schemes which are yet to be identified and selected; in order to target a total of about 5,000 ha upgraded with ARCP assistance.

15. Detailed studies for upgrading four schemes (command area of 424 ha; estimated work costs BAM 5 million) in FBiH have been prepared. These studies often considered various improvement options (with associated various investment and operational costs) and initial steps to obtain permits (municipality permit, environmental permit, power permit, water extraction right) for later carrying out the proposed works were initiated. For some schemes, a cost-benefit analysis (CBA) was carried out notably comparing the various upgrade options³¹. However, their depth and quality quite vary.

16. Experience from the IDP (as highlighted in IDP’s ICR report), based on the results for upgrading the Goražde (FBiH) and Novo Selo (RS) schemes, showed that: (i) yields were effectively improved; (ii) the farmers that were not receiving water before the project or those at tail end who didn’t receive enough water to fully crop their plots and who were receiving a partial water allocation that didn’t allow them to reach full yield and cropping intensity potential substantially

³¹ CBA translated into English and which made available to the design team include: Žepče, Živinice and Čapljina schemes.



increased their effective cropped area and yields, and subsequently their yield and production; and (iii) improvements allowed for a progressive change in cropping patterns from staples and grasses to higher value crops notably vegetables and fruits, etc.³²

Economic analysis

17. CBAs have been conducted to assess the economic viability of the ARCP from the overall national economy standpoint.

18. **Main features.** The analysis has been conducted over a 25-year period in constant 2021 prices. Financial project costs have been transformed into economic values applying an average conversion factor of 0.9 in order to eliminate taxes and transfers. Production costs and benefit streams have been converted into economic value applying conversion factors for internationally traded outputs, notably export products and imported inputs such as seeds and chemicals. Incremental costs after the project implementation period were also taken into account. Detailed calculations of economic benefits, investment costs and economic cash flows generated by components are being provided in the project file and are summarized in this Annex.

19. **Economic benefits considered in the analysis.** Activities under components 1 and 3 are well identified in scope and nature; however, their potential benefits are mostly non-quantifiable. Quantified economic benefits considered in the analysis are those derived from: (a) value chain development subprojects under the subcomponent 2.1, keeping in mind these will be strictly financed under a demand-driven basis thus forecasting and quantifying benefits from these SPs is highly hypothetical; (b) irrigation improvements under subcomponent 2.2 (considering the incremental net value of agricultural production and environmental benefits); and (c) the value of net GHG emissions reduction.

20. **Value chain development/Matching Grant scheme (subcomponent 2.1).** For this subcomponent, a typical net incremental cash flow profile generated by one BAM/euro of matching grant was estimated, based on experience in funding similar types of subprojects (see table in Appendix), and is summarized in the table below.

TYPICAL CASH FLOW PROFILE (in percentage of the SP costs) a/	Project Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Average cash flow profile	-95%	6%	19%	31%	33%	33%	33%	33%	33%	8%	33%	33%	33%	33%	8%

21. A failure rate of 20 percent³³ was considered to cater for the fact that some funded sub-projects might not accrue any additional economic benefit (i.e. their net additional income in the "with project" situation would only offset the investment costs), in order to be on a safe side. Based on these assumptions, and taking into consideration all sub-component 2.1 economic costs, the matching grant scheme (sub-component 2.1) would yield an Economic Internal Rate

³² In Goražde, the scheme upgrade consisted in switching from small-scale individual irrigation to a common irrigation scheme, through installing six shared pumping stations, low-cost water reservoirs, buried PVC pipes for water conveyance, and provision of turnouts (hydrants) to groups of farmers. The planned gross area benefiting from improvement was estimated at 200 to 300 ha, for an investment cost of USD 2 million (excluding on-farm irrigation equipment and land improvement). On average, crop yields were expected to increase by about 50%. But for those farmers that previously had no access to water and would receive irrigation services thanks to the project intervention, the increase in yield and production could be 2 to 3 times of their current levels. As farm sizes are small, some land consolidation was expected, as well as the development of a leasing market for land. It was expected that these project improvements would allow for increases in household income by 55% to 134 %, depending on the farm size and cropping patterns. Calculations made at ICR stage took into consideration actual yield increases, change in cropping patterns, expansion of area effectively irrigated etc. And confirmed the viability of the irrigation upgrade investment: the economic internal rate of return (ERR) was estimated at about 20% at the Goradze scheme (22 percent in the case of Novo Selo scheme). Source: World Bank, Bosnia and Herzegovina Irrigation Development Project (IDP, Credit No. 5098), Implementation Completion and Results Report (ICRR), Report No. ICR00005006, 28 September 2020.

³³ for failed sub-projects: it is assumed the net incremental cash flow (difference between yearly cash flows in the "with project" and "without project" situations) is nil; in other words, for such failed sub-projects the net additional income in the "with project" situation would only offset the investment costs met, without accruing any incremental benefit.



of Return (EIRR) of 19 percent and an Economic Net Present Value (ENPV) of EUR 9 million.

22. A sensitivity analysis was run to test the impact of an increased sub-project failure rate (see table below). It shows a strong resilience of the EIRR and ENPV to increased failure rate. In case the failure rate would be 30 percent, the EIRR would establish at 16 percent. In the extreme case of a 50 percent failure rate (highly unlikely) the EIRR would still be of 10 percent, well above the social costs of capital, and the ENPV would still be positive.

Sensitivity Analysis - Subcomponent 2.1				
	SP Failure rate			
	20%	25%	30%	50%
EIRR	19%	18%	16%	10%
ENPV (Euro Million)	9	8	7	3

a/ at 5% social discount rate.

23. **Irrigation sub-project (sub-component 2.2).** The economic return from some irrigation subprojects proposed for financing under the ARCP were estimated over 30 years, considering the specific scheme investments and operational costs, forecasted yield increases, input/output prices and changes in cropping pattern specific to each location, and environmental benefits (such as non-use value of improved surface and ground water quality).

24. **Žepče scheme.** As an example, calculations made for the Žepče scheme (BAM 3.4 million investment in phase 1, BAM 9.2 million total cost; 169 ha) indicate this subproject would yield an economic rate of return (ERR) of 38 percent, an economic net present value (ENPV) of BAM 25 million, and a benefit/cost (B/C) ratio of 5.0, clearly demonstrating its economic viability.

25. The overall net economic returns of subcomponent 2.2 cannot be estimated at this stage as: (i) there is a high variability in investment costs, water requirements, production pattern and systems, access to markets etc. between irrigation schemes envisaged to be upgraded under the ARCP, and the few ones for which a CBA is available cannot be considered as representative; and (ii) sequence in which these schemes would be supported is not yet known, making aggregation of benefits hypothetical.

26. Thus, the need to carry out a thorough financial and economic analysis for each proposed scheme. Showing positive results for both financial criteria (e.g. answering whether the water fees would be adequate to cover the O&M and the replacement of assets costs, and whether the proposed level of water fees is compatible with the expected increased income of irrigators thanks to the scheme upgrade) and economic criteria (acceptable ERR, ENPV and B/C ratio) are eligibility criteria for approving the financing of each schemes. These aspects should be well reflected in the Project Operational Manual and duly and regularly checked by both PIUs and the Bank.

27. An estimate of the economic viability of sub-component 2.2 was made using the Žepče scheme assumptions and calculations. This allowed to derive a typical economic benefit stream generated by irrigation upgrade for each BAM invested which would be as follows:

	Project Year																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Economic benefits per BAM invested (typical scheme)	0%	0%	28%	34%	39%	43%	47%	48%	48%	48%	48%	49%	49%	49%	49%	50%	50%	51%	51%	51%	51%	51%	53%	53%	53%

28. Considering the schedule of irrigation upgrade works assumed in the project costing and all sub-component 2.2 economic costs, the sub-component 2.2 would yield an EIRR of 29 percent and an ENPV of EUR 125 million. Results of the sensitivity analysis show a very strong resilience to increases in cost and reductions or delays in accruing benefits. The EIRR would still establish at respectively 21, 17 and 22 percent in extreme cases in which costs would be increased



by 50 percent and benefits would be reduced by 50 percent or lagged by two years, as shown in the table below.

Summary of Sensitivity Analysis - Subcomponent 2.2 a/										
	Base case	Increase in costs			Reduction of benefits				Benefits lagged by	
		+10%	+20%	+50%	-10%	-20%	-30%	-50%	1 year	2 years
EIRR	29%	27%	26%	21%	27%	25%	24%	17%	25%	22%
ENPV (Euro Million)	125	122	119	110	109	94	89	48	113	101

a/ assuming Zepce scheme calculations are representative of all funded schemes.

29. **GHG emissions reduction benefits.** Project activities would generate a reduction in GHG emission estimated at 610,938 tons of CO2 equivalent over 25 years (see Annex 4) with the following progressive accumulation.

Items	Parameter	Project Year					
		1	2	3	4	5	6 to 25
I. HYPOTHESIS							
Pace of accruing benefits	(%)	-	20%	40%	80%	100%	100%
II. GHG EMISSIONS (tons of CO2 equivalent)	<div>total over 25 years</div> <div>yearly average</div>						
Without project	337,390 13,496	13,496	13,496	13,496	13,496	13,496	13,496
With project	-273,548 -10,942	13,496	-2,188	-4,377	-8,754	-12,939	-12,939
Incremental balance	-610,938 -24,438	0	-15,684	-17,872	-22,249	-26,435	-26,435

30. This allowed to estimate the total and discounted value of net emission reductions over the project implementation using low, medium and high shadow price of carbon (SPC)³⁴ as shown in table below. GHG emission reduction benefits derived from the project would amount to 21 to 41 million depending on shadow price of carbon used (resp. EUR 11 to 22 million after discounting). They in fact would represent a small share in the overall economic benefits expected from the project (resp. 6 and 11 percent of total economic benefits considering low and high SPC).

31. **Overall project economic return.** An indicative overall project economic return taking into account all benefits and project costs has been estimated. However, it should be considered with caution as:

- (i) there is a high variability in expected potential returns from proposed irrigation schemes, and uncertainty with regards to which ones would be effectively supported, and in which sequence over the five-year implementation period, which would influence the net benefit streams generated. Thus, the attempt in aggregating net economic benefits for subcomponent 2.2 shown above is highly hypothetical and might be misleading; and
- (ii) identically, expected returns from sub-projects under subcomponent 2.1 would highly vary and depend on the type of funded activity, ranging from bulking raw products with limited commercial margin (such as in the fruit and vegetable bulking & marketing cooperative model developed for the financial analysis) to more profit-making SME model, upgrading processing lines, enhancing energy efficiency of agro-processing plants, branding and marketing support, etc. As already indicated, the fruit and vegetable bulking model developed for the financial analysis cannot be considered as representative

32. Therefore, the need arises to systematically prepare a sound business plan -notably including both a financial and economic analysis- for each irrigation scheme and value chain development sub-project.

33. Base on the above-described assumptions and considering all project costs (although no benefits could be accounted for components 1, 3 and 4) but excluding GHG benefits, the project would yield an EIRR of 20 percent and an

³⁴ As recommended in the World Bank "Guidance note on shadow price of carbon in economic analysis" published in November 2017.



ENPV of EUR 116 million. Adding GHG benefits, the EIRR and ENPV would establish at resp. 21 to 22 percent and EUR 127 to 138 million using resp. low and high SPC.

34. **Sensitivity analyses.** Sensitivity analyses were conducted to test the impact of increases in costs and reductions and delays in benefits on the “base scenario” that considers all project costs and GHG benefits at low SPC. It shows a very strong resilience of the project overall economic returns as summarized in the table below. For example, even in the extreme (and unlikely) case of benefits being reduced by 50 percent, the EIRR would still establish at 11% and the ENPV would be EUR 36 million.

Summary of Sensitivity Analysis - Base case a/												
	Base case	Increase in costs			Benefit increase		Reduction of benefits				Benefits lagged by	
		+10%	+20%	+50%	10%	+20%	-10%	-20%	-30%	-50%	1 year	2 years
EIRR	21%	19%	18%	15%	23%	24%	19%	17%	17%	11%	18%	16%
ENPV (Euro Million)	127	122	116	100	146	164	109	91	85	36	114	101

a/ all project costs, with GHG benefits at low carbon price.

35. **Physical output and risks.** Additional production resulting from irrigation schemes upgrade. Albeit substantial, is unlikely to affect local and national markets and farm gate (and value chain actors) prices downward, and hence producers’ and value chain actors’ incomes. Under sub-component 2.1, matching grants geared to aggregators in targeted value chains will offer new market opportunities, increase storage and conservation capacities, stabilize markets, shortcut intermediaries and contribute to reducing transaction costs. These impacts are likely to offset any potential negative effects that reduced retail prices may have on participating producers’ farm gate prices. Increased value added as a result of productivity gains, labelling or certification for some commodities, enhanced quality, economies of scale (the latter also having a direct impact on transaction costs) and more direct linkages between producers and large formal traders and exporters may offset any occurrence of lower farm gate prices in the “with project” situation.

Fiscal Impact

36. In the short-term, the fiscal impact of the project is likely to be neutral, given that the BiH’s contribution to project costs is expected to be very limited or even nil (if the loan finances 100 percent of costs - except for sub-projects and irrigation schemes upgrade for which a minimum contribution from their promoters, of respectively 35 percent and 10-15 percent will be requested). In the medium to long-term, however, the potential fiscal impact of the project might be positive, due to: (i) increased output, income and more formal employment, resulting in increased tax revenues; and (ii) multiplier effects due to increased economic activities in target areas, and subsequent sustained demand for goods and services, which is expected to generate additional income and employment effects.

Rationale for public sector provision/financing

37. The project would address a number of market failures: (a) the difficulties of small scale producers to access markets notably EU export markets and deficient links between them and formal agribusinesses/ traders/ exporters/ input suppliers; (b) the difficulties of smallholders and of value chain actors to access investment financing and the inability of existing national finance institutions (commercial banks and microfinance institutions) to provide adapted short to medium term value chain finance products (to boost technology adoption and marketing of production); (c) deficiencies of smallholders access to improved technologies, information, knowledge, certified improved planting material/breeds and other agricultural inputs, etc.

38. The project also has a redistribution role as it targets groups (smallholders) that are somewhat excluded from the



mainstream national financial and commercial markets and commodities/value chains that have a large potential for making small scale family farming more profitable and business oriented. It also has a political dimension as it perfectly fits into the BiH strategy aiming at transforming agriculture into a sustainable and commercially-oriented business, while protecting the environment and conserving the country's natural resource base, improving the resilience of fragile ecosystems to climate change, adapting them and value chain to climate change, combatting rural poverty, promoting human rights and democracy, sustainable and integrated development including through decentralization and promotion of local and demand-driven development approaches.

39. Therefore public intervention is fully justified to: (a) enhance resilience and sustainable management of the target value chains and irrigation schemes; (b) promote economic diversification and develop value chains conducive to small scale family farming production systems resilience; (c) establish strategic economic partnerships and support productive partnerships between producers and value chain actors to overcome market barriers; (d) support the modernization of agricultural and livestock production, marketing and processing systems, including through access to improved technologies, inputs and finance; (e) kick start and co-finance sub-projects through matching grants (possibly combined with enhanced access to short term and medium term credit for working capital requirements and later further investments granted by national financial institutions); and (f) support reforms and modernization of legal and regulatory frameworks as well as key investment in capacity development, processes, IT systems and adaptive research to enhance food safety and quality, promote exports and support EU accession.

40. The proposed project as an Investment Project Financing (IPF) is thus an appropriate instrument to achieve the PDO and the Project intermediate results.

Value added of World Bank's support

41. The project is well aligned with the priority themes of the current Country Partnership Framework (CPF) and it the project will contribute to the World Bank's ambitious twin goals of ending extreme poverty and promoting shared prosperity and growth. The project has significant added value from the BiH and development community standpoint. Beyond financing, the added value arises mainly from the Bank's (and FAO's)³⁵ technical support based on international experience for similar: integrated institution and capacity building (of both public institutions and smallholders/value chain actors through targeted international technical assistance and participatory and training and advisory services, including for the ex-ante preparation and financial analysis of sub-projects/business plans) projects; value chain development and support to productive partnership and alliance projects; irrigation development projects. Such integrated support will complement and aim at correcting deficiencies of national sources of expertise and business advisory support services to value chain actors and small-scale producers (and their organizations), resulting in increasing the project's development impact in ways that go beyond what could be realized by exclusive reliance on the BiH own institutions or existing national advisory services providers.

42. The Bank's support also provides opportunities for fostering Public-Private-Producer Partnerships to support promising value chain development thanks to the Bank's convening power which allowed to bring on the same discussion table family farmers and producers (notably smallholders), formal value chain actors involved in agricultural products trade, input supply, processing and import/export, Ministries, local councils and national financing institutions. This convening function will be pursued during project implementation and formalized through the establishment of appropriate contracts and strengthening existing producers' and value chain actors' organizations and concertation mechanisms (for example with possibly value chain platforms), as appropriate.

³⁵ FAO participated in the technical design under the FAO/World Bank Cooperative Programme (FAO/CP).



Fruit and Vegetable Bulking and Marketing Agricultural Cooperative Model - Financial analysis (in BAM Thousand)

ITEM	Without project	With project														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cash flow from business activities	18	18	15	32	75	100	100	100	100	100	100	100	100	100	100	100
Income																
Vegetables and fruit sales	40	40	57	286	743	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Quantity sold (tons)	70	70	100	500	1,300	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Unit price (BAM/ton)	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571	571
Annual membership fees	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Sub-total income	70	70	87	316	773	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030
Expenditure																
Vegetables & fruit purchase from members a/	36	36	51	257	669	900	900	900	900	900	900	900	900	900	900	900
Warehouse maintenance	0	0		5	5	5	5	5	5	5	5	5	5	5	5	5
Equipment maintenance	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank fees	0.5	0.5	1	2	3	4	4	4	4	4	4	4	4	4	4	4
Manager	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Engineers	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Book keeping	1.5	1.5	2	3	4	4	4	4	4	4	4	4	4	4	4	4
Tel & internet	0.5	0.5	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Water and various	0.5	0.5	1	2	2	2	2	2	2	2	2	2	2	2	2	2
Sub-total	52	52	72	284	697	930	930	930	930	930	930	930	930	930	930	930
Cash flow from financing	0	-60	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income																
Financing received from IFAD project	0	200														
Financing received from the municipality	0	600														
Own cooperative resources	0	200														
Sub-total income	-	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Expenditure																
600 m2 warehouse (300 tons)	0	1,000														
Small equipment (fork lift, etc.)	0	60										60				
Sub-total	-	1,060	-	-	-	-	-	-	-	-	-	60	-	-	-	-
Total cash flow (before financing)	18	-1,042	15	32	75	100	100	100	100	100	100	40	100	100	100	100
Total cash flow (after financing)	18	-42	15	32	75	100	100	100	100	100	100	40	100	100	100	100
Cumulative cash flow (after financing)		-42	-27	5	80	181	281	381	481	581	682	722	822	922	1,022	1,123
Incremental cash flow before financing ("with project" minus "without project")		-1,061	-4	12	54	78	78	78	78	78	78	18	78	78	78	78
Investment profile (annual cash flow in % of investment cost)		-98%	1%	3%	7%	9%	9%	9%	9%	9%	9%	4%	9%	9%	9%	9%
FRR (before financing)			7%													
FRR (after financing)			93%													
FNPV (before financing)	BAM '000	386	(@ 4% financial discount rate)													
FNPV (after financing)	BAM '000	1,348	(@ 4% financial discount rate)													
ERR			4%													
ENPV @ 4% discount rate			-111	(@ 5% social discount rate)												
Sales margin for the coop		10%														



Estimates of the Matching Grant Scheme economic benefits (subcomponent 2.1)

Items	Parameter		Year 1	Year 2	Year 3	Year 4	Year 5	Total															
I. HYPOTHESIS																							
MG disbursement pace	%	per year	0%	46%	0%	54%	0%	100%															
MG disbursed (EUR Thousand)			0	2,750	0	3,250	0	6,000															
Sub-projects (SP) Total Investment Costs (all sources of finance) a/	65%	MG on SP costs	0	4,231	0	5,000	0	9,231															
Technical Assistance and various costs			188	148	178	136	0	650															
Base Costs sub-component 2.1 (MG scheme)			188	4,379	178	5,136	-	9,881															
SP Failure Rate b/	20%																						
Investment Costs of SPs generating an additional benefit			0	3,385	0	4,000	0	7,385															
TYPICAL CASH FLOW PROFILE (in percentage of the SP costs) a/			Project Year																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
SP type 1	400	59%	10%	-90%	20%	30%	100%	100%	100%	100%	100%	100%	50%	100%	100%	100%	100%	50%					
SP type 2	300	19%	50%	-100%	0%	15%	25%	30%	30%	30%	30%	30%	5%	30%	30%	30%	30%	5%					
SP type 3	200	17%	40%	-90%	10%	20%	20%	20%	20%	20%	20%	20%	0%	20%	20%	20%	20%	0%					
Average cash flow profile			24%	-95%	6%	19%	31%	33%	33%	33%	33%	33%	8%	33%	33%	33%	33%	8%					
Average incremental benefits over investment (before financing)				5%	6%	19%	31%	33%	33%	33%	33%	33%	8%	33%	33%	33%	33%	8%					
III. AGGREGATED ECONOMIC BENEFITS (Euro Thousands)																							
SP funded in year 1			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SP funded in year 2				169	203	626	1,032	1,117	1,117	1,117	1,117	1,117	254	1,117	1,117	1,117	1,117	254	0	0	0	0	
SP funded in year 3					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SP funded in year 4						200	240	740	1,220	1,320	1,320	1,320	1,320	1,320	300	1,320	1,320	1,320	300	0	0	0	
SP funded in year 5							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total yearly benefits			0	169	203	826	1,272	1,857	2,337	2,437	2,437	2,437	1,574	2,437	1,417	2,437	2,437	1,574	1,320	300	0	0	
IV. NET ECONOMIC BENEFITS (Euro Thousand)																							
Subcomponent 2.1 economic costs			169	3,941	160	4,622	0																
Net economic benefits			EIRR	19%																			
			ENPV c/ 9 Euro Million	-169	-3,772	43	-3,796	1,272	1,857	2,337	2,437	2,437	2,437	1,574	2,437	1,417	2,437	2,437	1,574	1,320	300	0	0

a/ SP costs include investment costs (in the "with project" situation) and additional working capital needs for the first cycles of production in year 1. Investment costs notably include capacity building, training and technical assistance for the SP promoter/owner

b/ for failed SPs: it is assumed the net incremental cash flow (difference between the cash flows in the "with project" and "without project" situations) is nil. In other words, for such failed SPs, the net additional income in the "with project" situation only offsets the investment costs without accruing any additional benefit.

c/ at 5% discount rate.



Indicative Economic benefits from irrigation development (subcomponent 2.2) (in EUR thousand)

		Project Year																									
	Parameter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Economic benefits per BAM invested (typical scheme)		0%	0%	28%	34%	39%	43%	47%	48%	48%	48%	48%	49%	49%	49%	49%	50%	50%	51%	51%	51%	51%	51%	53%	53%	53%	
II. IRRIGATION UPGRADE WORK COSTS (EUR)		Project Year																									
Total over 5 years																											
FBIH schemes works		17,049	2,592	0	5,783	5,783	2,891																				
RS schemes works		14,802	2,960	4,441	5,921	1,480	0																				
Total		31,851	5,553	4,441	11,704	7,263	2,891																				
III. IRRIGATION UPGRADE ECONOMIC BENEFITS (EUR)																											
Upgrade in project year 1		0	0	1,573	1,896	2,142	2,388	2,634	2,647	2,661	2,674	2,688	2,701	2,716	2,730	2,745	2,759	2,774	2,849	2,849	2,849	2,849	2,849	2,928	2,928	2,928	
Upgrade in project year 2			0	0	1,258	1,517	1,713	1,910	2,106	2,117	2,128	2,139	2,150	2,160	2,172	2,184	2,195	2,207	2,218	2,279	2,279	2,279	2,279	2,342	2,342	2,342	
Upgrade in project year 3				0	0	3,315	3,997	4,515	5,033	5,551	5,580	5,608	5,637	5,665	5,694	5,724	5,755	5,785	5,816	5,846	6,006	6,006	6,006	6,006	6,006	6,172	
Upgrade in project year 4					0	0	2,057	2,480	2,802	3,123	3,445	3,463	3,480	3,498	3,516	3,534	3,552	3,571	3,590	3,609	3,628	3,727	3,727	3,727	3,727	3,727	
Upgrade in project year 5						0	0	819	987	1,115	1,243	1,371	1,378	1,386	1,393	1,400	1,407	1,414	1,422	1,429	1,437	1,444	1,484	1,484	1,484	1,484	
Total benefits		316,299	0	0	1,573	3,154	6,974	10,155	12,358	13,576	14,568	15,070	15,269	15,347	15,425	15,505	15,586	15,668	15,751	15,895	16,013	16,199	16,305	16,344	16,423	16,487	16,653
IV. NET ECONOMIC BENEFITS (Euro Thousand)																											
Sub-component 2.2 economic costs		5,989	5,249	11,057	6,835	2,689	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	
Net economic benefits		EIRR																									
		29%	124,804	-5,989	-5,249	-9,484	-3,681	4,284	9,955	12,158	13,376	14,368	14,870	15,069	15,147	15,225	15,305	15,386	15,468	15,551	15,695	15,813	15,999	16,105	16,144	16,223	16,287

a/ at 5% discount rate.

Economic benefits from the GHG emission reduction (in EUR thousand)

Items	Parameter	Project Year																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
I. HYPOTHESIS																										
Pace of accruing benefits (%)		-	20%	40%	80%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
II. GHG EMISSIONS (tons of CO2 equivalent)	total over 25 years	yearly average																								
Without project	337,390	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496	13,496
With project	-273,548	-10,942	13,496	-2,188	-4,377	-8,754	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939	-12,939
Incremental balance	-610,938	-24,438	0	-15,684	-17,872	-22,249	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435	-26,435
III. GHG BENEFITS (Euro Thousand)	ton CO2 price USD	Euro																								
Low shadow price of carbon	40	34	0	528	601	749	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889
Medium shadow price of carbon	60	50	0	792	902	1,123	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	
High shadow price of carbon	80	67	0	1,055	1,203	1,497	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	
IV. NET ECONOMIC BENEFITS (Euro Thousand)																										
Project costs (comp 2 only)			6,158	9,202	11,217	11,446	2,689																			
Project costs (after implementation period)								54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Net accrued benefits	EIRR	ENPV c/																								
Low shadow price of carbon	-6% (24,955)		-6,158	-8,675	-10,615	-10,697	-1,800	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836	836
Medium shadow price of carbon	-3% (19,458)		-6,158	-8,411	-10,315	-10,323	-1,355	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	
High shadow price of carbon	0% (13,960)		-6,158	-8,147	-10,014	-9,949	-911	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	1,725	

a/ SP costs include investment costs (in the "with project" situation) and additional working capital needs for the first cycles of production in year 1. Investment costs notably include capacity building, training and technical assistance for the SP promoter/owner and staff that are necessary

b/ for failed SPs: it is assumed the net additional cash flow (generated by difference of the cash flow in the "with project" and "without project" situations) is nil; in other words for such failed SPs, the net additional income in the "with project" situation would only offset the investment costs

c/ at 5% discount rate.



Project economic cash flow (in EUR thousand)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25											
1. PROJECT ECONOMIC COSTS a/																																				
Investment costs		11,545	17,259	14,456	13,129	3,715																														
component 1		715	3,707	2,127	645	339																														
component 2		6,158	9,202	11,217	11,446	2,689																														
component 3		4,056	3,740	482	482	54																														
component 4		616	610	631	556	633																														
Incremental costs (after implementation period)							200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200								
Total project economic costs		11,545	17,259	14,456	13,129	3,715	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200								
Total excluding components 1 and 3		6,774	9,812	11,847	12,002	3,323	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200								
2. INCREMENTAL ECONOMIC BENEFITS																																				
Irrigation development		0	0	1,573	3,154	6,974	10,155	12,358	13,576	14,568	15,070	15,269	15,347	15,425	15,505	15,586	15,668	15,751	15,895	16,013	16,199	16,305	16,344	16,423	16,487	16,653	total low SPC	316,299	87%	total medium SPC	316,299	84%	total high SPC	316,299	82%	
Value chain development (Matching Grant scheme)		0	169	203	826	1,272	1,857	2,337	2,437	2,437	2,437	1,574	2,437	1,417	2,437	2,437	1,574	1,320	300	0	0	0	0	0	0	0	27,471	87%	316,299	84%	27,471	7%	316,299	82%		
GHG emission reduction																																				
Low shadow price of carbon (SPC)		0	528	601	749	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	889	20,554	6%								
Medium shadow price of carbon		0	792	902	1,123	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334	1,334					30,831	8%				
High shadow price of carbon		0	1,055	1,203	1,497	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779	1,779					0%	41,109	11%		
Total without GHG benefits		0	169	1,776	3,980	8,246	12,012	14,695	16,013	17,005	17,507	16,843	17,784	16,842	17,942	18,023	17,242	17,071	16,195	16,013	16,199	16,305	16,344	16,423	16,487	16,653	364,324	100%	374,601	100%	384,878	100%				
Total with GHG benefits																																				
Low shadow price of carbon (SPC)		0	697	2,377	4,729	9,135	12,901	15,584	16,902	17,894	18,397	17,732	18,673	17,732	18,831	18,912	18,132	17,961	17,085	16,902	17,088	17,194	17,234	17,313	17,376	17,543										
Medium shadow price of carbon		0	961	2,678	5,103	9,580	13,346	16,029	17,347	18,339	18,841	18,177	19,118	18,176	19,276	19,357	18,576	18,405	17,529	17,347	17,533	17,639	17,678	17,757	17,821	17,987										
High shadow price of carbon		0	1,225	2,978	5,477	10,025	13,791	16,473	17,792	18,784	19,286	18,622	19,562	18,621	19,720	19,802	19,021	18,850	17,974	17,791	17,977	18,084	18,123	18,202	18,265	18,432										
3. NET ECONOMIC CASH FLOW																																				
EIRR		20%	116,323																																	
ENPV a/		20%	116,323	-11,545	-17,090	-12,681	-9,149	4,530	11,812	14,495	15,813	16,805	17,307	16,643	17,584	16,642	17,742	17,823	17,042	16,871	15,995	15,813	15,999	16,105	16,144	16,223	16,287	16,453								
Total project costs without GHG benefits		20%	116,323	-11,545	-17,090	-12,681	-9,149	4,530	11,812	14,495	15,813	16,805	17,307	16,643	17,584	16,642	17,742	17,823	17,042	16,871	15,995	15,813	15,999	16,105	16,144	16,223	16,287	16,453								
Total project costs with GHG benefits		21%	127,318	-11,545	-16,562	-12,079	-8,400	5,420	12,701	15,384	16,702	17,694	18,197	17,532	18,473	17,532	18,631	18,712	17,932	17,761	16,885	16,702	16,888	16,994	17,034	17,113	17,176	17,343								
Low shadow price of carbon (SPC)		21%	127,318	-11,545	-16,562	-12,079	-8,400	5,420	12,701	15,384	16,702	17,694	18,197	17,532	18,473	17,532	18,631	18,712	17,932	17,761	16,885	16,702	16,888	16,994	17,034	17,113	17,176	17,343								
Medium shadow price of carbon		22%	132,815	-11,545	-16,298	-11,779	-8,026	5,864	13,146	15,829	17,147	18,139	18,641	17,977	18,918	17,976	19,076	19,157	18,376	18,205	17,329	17,147	17,333	17,439	17,478	17,557	17,621	17,787								
High shadow price of carbon		22%	138,313	-11,545	-16,035	-11,478	-7,652	6,309	13,591	16,273	17,592	18,584	19,086	18,422	19,362	18,421	19,520	19,602	18,821	18,650	17,774	17,591	17,777	17,884	17,923	18,002	18,065	18,232								
Excluding comp. 1&3 without GHG benefits		26%	131,110	-6,774	-9,643	-10,072	-8,022	4,923	11,812	14,495	15,813	16,805	17,307	16,643	17,584	16,642	17,742	17,823	17,042	16,871	15,995	15,813	15,999	16,105	16,144	16,223	16,287	16,453								
Excluding comp. 1&3 with GHG benefits		28%	142,105	-6,774	-9,115	-9,470	-7,273	5,812	12,701	15,384	16,702	17,694	18,197	17,532	18,473	17,532	18,631	18,712	17,932	17,761	16,885	16,702	16,888	16,994	17,034	17,113	17,176	17,343								
Low shadow price of carbon (SPC)		28%	142,105	-6,774	-9,115	-9,470	-7,273	5,812	12,701	15,384	16,702	17,694	18,197	17,532	18,473	17,532	18,631	18,712	17,932	17,761	16,885	16,702	16,888	16,994	17,034	17,113	17,176	17,343								
Medium shadow price of carbon		29%	147,602	-6,774	-8,851	-9,170	-6,899	6,257	13,146	15,829	17,147	18,139	18,641	17,977	18,918	17,976	19,076	19,157	18,376	18,205	17,329	17,147	17,333	17,439	17,478	17,557	17,621	17,787								
High shadow price of carbon		30%	153,100	-6,774	-8,588	-8,869	-6,524	6,702	13,591	16,273	17,592	18,584	19,086	18,422	19,362	18,421	19,520	19,602	18,821	18,650	17,774	17,591	17,777	17,884	17,923	18,002	18,065	18,232								

a/ at 5% social discount rate.



ANNEX 5: Greenhouse Gas Emission Assessment

COUNTRY: Bosnia and Herzegovina Agriculture Resilience and Competitiveness Project

1. The World Bank Group's Environment Strategy 2012-2022 articulates an agenda to support green, clean, resilient paths for developing countries, and adopted a corporate mandate to conduct GHG emission accounting for investment lending projects. The quantification of GHG emission is an important step in managing and ultimately reducing GHG emission and is becoming common practice for many international financial institutions. To assess net carbon balance of its agricultural projects, the World Bank has adopted the Ex-Ante Carbon-Balance Tool (EX-ACT) developed by FAO in 2010.
2. An ex-ante assessment of the impact of the project on the GHG emission has been undertaken using the FAO EX-ACT tool. The net carbon balance is the difference between the gross results of with and without project scenarios for 25 years, including 5 years of project implementation and 20 years of capitalization periods. The project finances several activities that can be captured with the GHG accounting tool.
3. First, the activities of sub-component 1.2 improving seed and seedlings quality and extension service and the activities of sub-component 2.1 providing matching grants to leverage private sector investments into green and effective value chains, will lead to improved, climate smart agronomic practices for agricultural production, which are captured in EX-ACT's Cropland module as improved tillage and carbon input practices. Specifically, the land area for the GHG analysis is assumed to be 5,500 hectares (ha), upon which 5,405 ha will undergo changes that impact GHG emissions and mitigation. The assumed adoption rate of improved agronomic practices and nutrient management among project beneficiaries of the advisory services is approximately 70 percent of existing farmland (2,996 ha) and 100 percent of new cropland (1,503 ha).
4. Second, sub-component 2.2 improving irrigation and drainage systems is assumed to lead to an increase in land used for annual crop and vegetable production, orchards, and vineyards. The implementation ready irrigation schemes, available for a portion of the total target area, provide an indication of land use in areas that will become cultivated, typically abandoned, set aside and/or degraded land, or natural meadows. This change is captured in EX-ACT's LUC module. The activities are expected to lead to 1,503 ha of land to be newly cultivated when the schemes scaled-up to the entire target area. In terms of type of crops expected to be cultivated because of project support, we assume the current distribution described in the available implementation ready irrigation schemes, leading to an estimated 48.5 percent of new land cultivating annual crops and 46.0 percent with perennial orchards and 5.5 percent cultivating vineyards.
5. Third, within Component 2, the construction of value chain infrastructures and the irrigation and drainage systems also contributes to emissions of greenhouse gases, which is also estimated in EX-ACT's Inputs module. It was estimated that the project will result in about 40,000 square meters of building area, and that 25 and 75 percent of all materials used in the construction works will be metal and concrete, respectively. An estimation of the emissions from fuel, fertilizer, pesticide and irrigation inputs of newly cultivated land has been also included in the analysis, using compiled farm data and existing irrigation development schemes for some of the project areas.
6. Considering the abovementioned, the total net carbon balance was estimated at 610,938 tCO₂-eq of mitigated emissions (which means that carbon sequestration outweighs emissions within the project) over the project duration of



25 years, or 24,438 tCO₂-eq per year at full development. Details of the results are shown in Table 1.

Table 1: Results of the Ex-Ante GHG Analysis

Project activities	Over the economic project lifetime (tCO ₂ eq)			Annual average (tCO ₂ eq/ year)		
	GHG emissions of "without project" scenario (1)	Gross emissions of "with project" scenario (2)	Net GHG emissions (2-1)	GHG emissions of "without project" scenario (3)	Gross emissions of "with project" scenario (4)	Net GHG emissions (4-3)
Non-forest LUC	0	-158,691	-158,691	0	-6,348	-6,348
Annual Agriculture	229,861	-53,166	-283,027	9,194	-2,127	-11,321
Perennial Agriculture	103,822	-274,625	-378,447	4,153	-10,985	-15,138
Inputs and investments	3,707	212,934	209,227	148	8,517	8,369

Caveats. The project will finance advisory and post-harvest (collection, conditioning, storing, etc.) services and infrastructure that are demand-driven and not known ex-ante. Hence, the extent and type of the services to be provided cannot be accurately estimated ex-ante.



ANNEX 6: Map

COUNTRY: Bosnia and Herzegovina Agriculture Resilience and Competitiveness Project

