NORTH MACEDONIA

STUDY ON PRESSING ISSUES OF RURAL NORTH MACEDONIA WITH FOCUS ON GENDER DIMENSION

Prepared under the project
Harvesting Hope:
Community Rainwater Systems and Gardening for Gender Justice



Project Partners: Institute Circle and Legis
Donor: Ministry of Foreign and European Affairs
of the Republic of Slovenia as part of
international development cooperation
May 2026

Legis

Zavod KROG
institute circle

REPUBLIC OF SLOVENIA
MINISTRY OF FOREIGN
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Disclaimer and Acknowledgements

This study was commissioned by *Olimpija Hristova Zaevska*, an Expert commissioned by Legis in the framework of the Harvesting Hope project, co-funded by the **Ministry of Foreign and European Affairs of the Republic of Slovenia as part of international development cooperation**. The findings, interpretations, and recommendations expressed herein represent the independent analysis of the author and do not necessarily reflect the official positions of the project partners, the Ministry of Foreign and European Affairs of the Republic of Slovenia or the Government of North Macedonia.

The study draws on publicly available official data and peer-reviewed sources, including the State Statistical Office of North Macedonia, the Ministry of Agriculture, Forestry and Water Economy, the European Commission's annual Progress Reports, the regional planning region development centres, and the published databases of the Food and Agriculture Organization, the International Labour Organization, the World Bank, and the United Nations Development Programme. All data has been cross-referenced across independent sources and is accurate to the best of the author's knowledge as of the reporting period.

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List of Acronyms

AECP	Agri-Environment-Climate Payment (EU CAP)
APZRR	Agency for Financial Support of Agriculture and Rural Development (NMK)
AREC	Agency for Real Estate Cadastre
CAP	Common Agricultural Policy (European Union)
CBAM	Carbon Border Adjustment Mechanism (European Union)
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CSO	Civil Society Organisation
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FFS	Farmer Field School
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ILO	International Labour Organisation
IPA	Instrument for Pre-Accession Assistance
IPARD	IPA Rural Development Programme
IPCC	Intergovernmental Panel on Climate Change
IWMI	International Water Management Institute
LAG	Local Action Group (LEADER programme)
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale
MAFWE	Ministry of Agriculture, Forestry and Water Economy
MEPP	Ministry of Environment and Physical Planning
NARDS	National Agriculture and Rural Development Strategy
NBRNM	National Bank of the Republic of North Macedonia
NGFS	Network for Greening the Financial System
RBMP	River Basin Management Plan
RCP	Representative Concentration Pathway (IPCC climate scenario)

RWH	Rainwater Harvesting
SDG	Sustainable Development Goal
SSO	State Statistical Office of North Macedonia
SWOT	Strengths, Weaknesses, Opportunities, Threats
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VNR	Voluntary National Review
VSLA	Village Savings and Loan Association
WBGA	Western Balkans Green Agenda
WFD	Water Framework Directive (European Union)
WUA	Water User Association

North Macedonia's rural sector encompasses approximately 82 per cent of the national territory and sustains roughly 40 per cent of the population,[1] yet it remains overall structurally underperforming, climate-vulnerable, and institutionally under-resourced. Agriculture (including forestry and fishing) contributes around 6.5 to 7 per cent of GDP and employs approximately 9 per cent of the national labour force in 2024, a marked decline from the 10 per cent of GDP and higher employment shares of the 2010s, with significantly higher dependence in rural areas.[2] This study examines the pressing water and land challenges, agricultural productivity dynamics, rural tourism potential, and gender dimensions of rural development across five of North Macedonia's eight planning regions, namely Polog, Pelagonija, Vardar, Southeast, and Eastern, in alignment with the objectives of the Harvesting Hope project.

The study finds that all five regions face compounding challenges:

- declining soil fertility,
- irregular precipitation exacerbated by climate change,
- fragmented land holdings and an ageing agricultural population,
- and limited access to water infrastructure, finance,
- disproportionate challenges for women in agriculture
- and inefficient technical advisory services.

Women-headed households are disproportionately affected by these vulnerabilities yet remain structurally excluded from land titling, cooperative governance, and rural finance. This pattern is both well-documented and insufficiently addressed by existing policy instruments. The five regions are also strikingly diverse: Polog and Pelagonija differ from Vardar's wine-driven mid-Vardar valley economy; the Southeast Region's vegetable export complex around Strumica differs again from the rain-deficient mixed farming of the Eastern Region. Thus, a regionally differentiated rural development response is required.

Assessed against EU Common Agricultural Policy pre-accession benchmarks, the UN 2030 Sustainable Development Goals, and the Western Balkans Green Agenda commitments, North Macedonia's progress is partial and uneven.[3] IPARD III absorption remains below potential, Water Framework Directive transposition is incomplete, and indicators for SDG 2 (Zero Hunger), SDG 5 (Gender Equality), SDG 6 (Clean Water), SDG 13 (Climate Action), and SDG 15 (Life on Land) all show measurable structural gaps in rural areas.

The study identifies strong community-level potential for decentralised, low-cost water technologies, particularly rainwater harvesting, greywater recycling, and composting systems, that can directly improve smallholder resilience, reduce input costs, and enhance household food security. These technologies are accessible to women farmers and low-income households, making them catalytic entry points for inclusive rural transformation.

[1] State Statistical Office (SSO), Population Census 2021: Final Results, Skopje, 2022.

[2] World Bank, North Macedonia: Agriculture Sector Review, Washington D.C., 2022, p. 3; updated GDP share figure: World Bank, World Development Indicators (2024) — agriculture, forestry and fishing, 6.5–6.6 % of GDP; full-time agricultural employment Q3 2024: SSO Labour Force Survey, ~62,300 persons (≈9 % of total employment).

[3] European Commission, North Macedonia 2024 Report, SWD(2024) 693 final, Brussels, 30 October 2024.

The study further finds that the integration of climate-related financial risk into the supervisory framework of the National Bank of the Republic of North Macedonia (NBRNM), together with the draft Guidelines on Green Lending issued for public consultation in 2024, creates both a tightening constraint and a strategic opportunity. Without complementary pro-vulnerable and gender-responsive safeguards, climate risk pricing risks deepening the systemic exclusion of women smallholders and resource-poor households from formal credit. Equally, the quantified water savings, soil organic matter gains, and yield-stability outcomes generated by the project align directly with the criteria emerging green-lending instruments will use to identify lower-risk borrowers. Documented systematically, these outcomes can transform climate risk assessment from a barrier into an enabling condition for pro-poor rural finance, opening pathways for blended-finance instruments that combine donor capital with concessional and commercial co-financing.

The study concludes with two sets of recommendations. The study recommends a comprehensive seven-training one-day programme under the Harvesting Hope project to build capacity for inclusive and sustainable rural development. Five trainings target local experts and decision-makers in the areas of climate-smart agriculture and resource management, rural tourism and income diversification, gender equality and social inclusion, collaborative regional planning, and gender-responsive rural finance and green lending; a practical hands-on training equips beneficiary households with essential skills in rainwater harvesting, composting, and kitchen gardening; and a dedicated training strengthens rural women’s entrepreneurship and business development. All trainings are designed to be highly participatory, gender-sensitive, multilingual, and outcome-oriented, producing immediate actionable tools, plans, and skills that bridge community-level project interventions with institutional and economic transformation across Polog, Pelagonija, Vardar, Southeast, and Eastern regions.

Thirteen evidence-based recommendations are presented, structured around four pillars: integrated water and land governance; inclusive agricultural productivity enhancement; gender-transformative rural development; and alignment with EU accession and UN SDG frameworks. Delivery through community-based structures, combined with capacity building for local and regional authorities and local decision-makers, is identified as the primary implementation modality for the Harvesting Hope project.

1. Introduction and Background

1.1 Study Context and Purpose

This study was commissioned by Legis and Institute Circle, with support from the Government of the Republic of Slovenia, as the analytical foundation for the Harvesting Hope project. The project aims to strengthen the climate resilience, food security, and economic inclusion of smallholder farmers, particularly women and other vulnerable groups, across the Polog, Pelagonija, Vardar, Southeast, and Eastern Regions of North Macedonia through the community-scale deployment of rainwater harvesting systems, composting infrastructure, and kitchen and community gardens.

The study presents a comprehensive mapping of agricultural, water, land, tourism, and gender dynamics in the target regions. It situates these regional findings within the broader national and international policy architecture governing rural development in North Macedonia, including the country's EU accession obligations, UN Sustainable Development Agenda commitments, and the emerging climate-related supervisory and green-lending framework introduced by the National Bank of the Republic of North Macedonia, with the purpose of informing training design and regional sustainable rural development planning under the project.

1.2 Country Overview

North Macedonia is a landlocked, upper-middle-income country with a resident population of approximately 1.83 million (2021 Census; SSO 2024 mid-year estimate: 1.82 million).[4] The agricultural sector is dominated by smallholder family farms with average holdings of 1.5 to 2.5 hectares, a structure highly fragmented by regional and European standards.[5] The current National Agriculture and Rural Development Strategy 2021–2027 sets out the strategic policy framework,[6] while IPARD III provides the primary EU co-financing mechanism for rural investment.

The longer-run trajectory of agriculture in the national economy has been one of relative decline. As Figure 1 illustrates, the agriculture, forestry and fishing share of GDP has fallen from approximately 10.5 per cent in 2013 to 6.5 per cent in 2024 (World Bank WDI; SSO national accounts). The decline reflects a combination of slow agricultural productivity growth, faster expansion of services and manufacturing, and rural outmigration. It does not, however, indicate that rural livelihoods have become less critical: in the five target regions of this study, the share of household income derived from agriculture remains well above the national average, and a significant share of food production is consumed within the household and not captured in national accounts.

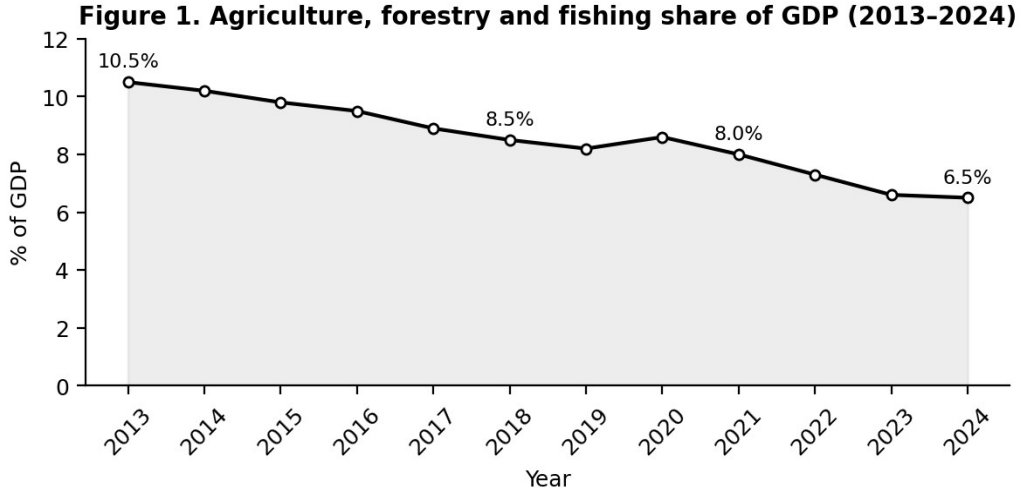


Figure 1. Agriculture, forestry and fishing share of GDP, North Macedonia, 2013–2024 (World Bank WDI; SSO national accounts).

Despite reform momentum driven by the EU accession process, the rural sector faces structural challenges that constrain productivity and household welfare: severe land fragmentation and incomplete cadastral registration; outdated irrigation infrastructure covering only 15 to 20 per cent of potentially irrigable land; increasing climate variability; limited access to credit and markets for smallholders; and chronic rural outmigration that has left an ageing and increasingly female dominated agricultural labour force. These challenges are unevenly distributed across regions.

1.3 The Harvesting Hope Project

The Harvesting Hope project operationalises a bottom-up, technology-enabled, and gender-sensitive approach to rural resilience. Its core intervention is the community-scale deployment of rainwater

[4]SSO, Population Census 2021: Final Results (Skopje, 2022); 2024 estimate: 1,822,612 persons (SSO, 31 December 2024).

[5]SSO, Census of Agriculture 2020: Key Results (Skopje, 2021), Table 3. The 2020 census remains the most recent comprehensive census; annual Farm Structure data are published in the SSO Statistical Yearbook 2025.

[6]MAFWE, National Agriculture and Rural Development Strategy 2021–2027 (Skopje, 2021).

collection systems, composting infrastructure, and kitchen and community gardens as affordable, replicable, and rights-based pathways out of water insecurity and food poverty for rural households, with particular attention to households headed by or dependent on women.

The project's overall objective is to assess the status, opportunities, and challenges of rural development in the target regions, with specific objectives spanning the identification of agricultural constraints and opportunities, water and land resource management issues, rural employment and tourism potential, gender and social dynamics, and training recommendations for regional decision-makers. This study constitutes an analytical output under that mandate.

2. Methodology

2.1 Research Design

The study employs quantitative secondary data analysis combined with qualitative policy assessment and comparative benchmarking. The design aims to triangulate data across independent sources, apply gender and social inclusion sensitivity throughout all analytical dimensions, and maintain policy relevance calibrated to the decision-making needs of the project's target audience of regional authorities and municipal decision-makers.

The analytical work is organised around five complementary streams. First, a systematic literature and policy review covering national strategies, EU progress reports, international agency assessments, regional planning region documents, and peer-reviewed research on the three thematic areas. Second, quantitative analysis was conducted of official national statistics from the SSO Agricultural Census 2020, MAFWE administrative datasets, the SSO Regions of the Republic of North Macedonia 2025 publication, and the World Bank and FAO country databases. Third, qualitative desk assessment was conducted of IPARD programme documentation, Water User Association records, regional development plans, and EU pre-accession monitoring reports. Fourth, stakeholder mapping identifying public, private, and civil society actors across the five regions with attention to gender-disaggregated participation. Fifth, comparative benchmarking was conducted against EU CAP pre-accession indicators, Western Balkans Green Agenda commitments, and UN SDG targets.

2.2 Analytical Approaches

SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) is applied to the integrated rural development challenge, and PESTLE analysis (Political, Economic, Social, Technological, Legal, Environmental) frames the enabling environment assessment. Gender and social inclusion dimensions are mainstreamed throughout the analytical narrative rather than siloed into a standalone chapter, though a dedicated synthesis section examines cross-cutting dynamics.

The study triangulates findings across sources. Where data gaps exist, particularly for gender-disaggregated sub-regional statistics, these are explicitly flagged and conservative estimates are presented. Limitations inherent in secondary data analysis, including temporal lags between data collection and publication, are acknowledged throughout.

2.3 Geographic Scope

The study covers five of North Macedonia's eight planning regions. The Polog Region in the north-west is predominantly Albanian-speaking, characterised by high population density, significant smallholder horticulture, and extreme land fragmentation. The Pelagonija Region in the south-west and centre is the country's agricultural heartland, with the largest flat irrigable land surface and the most pronounced demographic decline. The Vardar Region, in the central Vardar valley, contains the country's largest viticulture cluster centred on Tikveš, with major tobacco and stone fruit production alongside it. The

Southeast Region, anchored by Strumica, is the country's leading producer of early vegetables and one of its two principal vineyard zones, distinguished by an unusually sunny Mediterranean-influenced climate. The Eastern Region on the Bulgarian border combines mixed farming systems with the highest concentration of rural poverty and the lowest rainfall of the five. The remaining three planning regions of North Macedonia—the Skopje, Northeast, and Southwest Regions—fall outside the scope of this study because they either present a predominantly urban-metropolitan profile (Skopje), or are covered by ongoing parallel rural development initiatives whose interventions overlap geographically with the Harvesting Hope project's intended target areas (Northeast and Southwest), and their inclusion would have diluted the analytical depth required for the five priority regions selected for project delivery.

3. Regional Profiles

The five target regions differ markedly in geographic scale, population, and agricultural endowment. Figure 2 summarises the basic comparative profile drawn from the SSO Regions 2025 publication.

Figure 2. Regional profile: area, population, and agricultural land

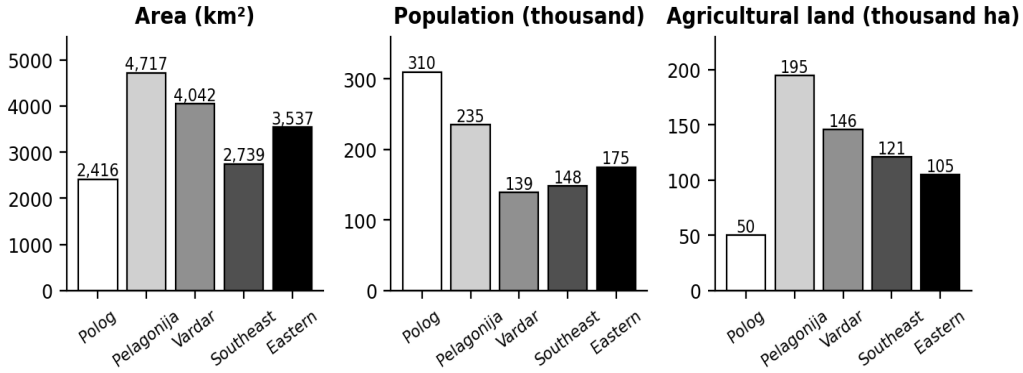


Figure 2. Regional profile of Polog, Pelagonija, Vardar, Southeast, and Eastern regions: surface area, population, and agricultural land (SSO, Regions of the Republic of North Macedonia 2025).

3.1 Polog Region

The Polog Region, centred on Tetovo and Gostivar, covers approximately 2,416 km² with an estimated population of 310,000.[7] It is the second most populous region in North Macedonia and is predominantly ethnic Albanian, with a notably younger demographic profile relative to the national average. Agricultural land covers approximately 50,000 hectares, with a strong tradition of small-scale protected horticulture (peppers, tomatoes, cucumbers), as well as dairy farming and medicinal and aromatic plant production.

The region faces acute water stress. The Vardar River tributaries flowing through Polog are subject to seasonal drought and increasing pollution from inadequately treated agricultural and municipal wastewater. Irrigation infrastructure is severely degraded: an estimated 60 to 70 per cent of irrigation canals are in disrepair.[8] Land fragmentation is extreme, with average farm size below one hectare, compounded by incomplete cadastral registration and customary land management practices that systematically bypass female heirs in inheritance proceedings.[9]

[7]SSO, Regions of the Republic of North Macedonia 2025 (Skopje, 2025), Polog regional indicators, 2024 reference year.

[8]MAFWE, Irrigation Sector Study: Assessment of Irrigation Infrastructure in North Macedonia (Skopje, 2022), p. 8.

[9]Agency for Real Estate Cadastre (AREC), Annual Report 2023 (Skopje, 2024), p. 34.

Women's access to agricultural land in Polog is particularly constrained. Female cooperative membership in the region is estimated at below 8 per cent, the lowest of the five study regions.[10] The region has significant rural tourism potential anchored on Mavrovo National Park and the Šar Planina massif, but rural accommodation infrastructure and visitor services remain underdeveloped.

3.2 Pelagonija Region

Pelagonija is North Macedonia's largest agricultural region, encompassing approximately 4,717 km² and a population of around 235,000, including the municipalities of Bitola, Prilep, Kruševo, and Resen.[11] The region contains the Pelagonia plain, the country's most extensive flat agricultural land and the core zone for wheat, maize, sunflower, tobacco, and apple production. Its irrigation infrastructure is relatively more developed than the other regions, with the Strezevo system designed to serve approximately 24,000 hectares, though currently operating at an estimated 8,000 to 12,000 hectares due to maintenance deficits and institutional fragmentation.[12]

Pelagonija is experiencing severe demographic decline, with population estimated to have decreased by 15 to 18 per cent since 2002 (author's estimate based on inter-census comparisons; finalised inter-censal series pending from SSO). The agricultural labour force is increasingly elderly and female, creating both challenges to new technology adoption and opportunities for women as primary agents of change.[13] Climate change is already affecting the region's agricultural system: documented shifts toward more intense but shorter rainfall events increase surface runoff and soil erosion, while lengthening droughts reduce effective water availability for crops.

The Resen sub-region, as a hub of apple and fruit production, and the heritage mountain town of Kruševo offer focused rural tourism opportunities that remain insufficiently linked to local agricultural identity. The Prespa Lake area is an internationally recognised biodiversity hotspot and Ramsar wetland, a potential anchor for nature-based rural tourism that connects the region's agricultural and environmental assets.

3.3 Vardar Region

The Vardar Region, in the central Vardar river valley, covers approximately 4,042 km² and represents the second-largest region by area but the smallest by population, with 138,722 inhabitants according to the 2021 Census, down from 154,535 in 2002, a decline of approximately 10 per cent.[14] The population density of around 34 inhabitants per km² is the lowest in the country. The region comprises nine municipalities including Veles, Kavadarci, Negotino, and Sveti Nikole, with a relatively high urbanisation rate as roughly 69 per cent of the population is concentrated in the urban centres of Veles and Kavadarci.

Agriculture is the dominant economic sector and the principal driver of rural livelihoods. Agricultural land covers approximately 145,699 hectares (about 12 per cent of the national total), of which 70,006 hectares are arable and 75,666 hectares are pastures. The Vardar Region is the country's pre-eminent viticulture zone: the Tikveš wine region around Kavadarci and Negotino contains approximately 45 per cent of North Macedonia's vineyard area, and Tikveš Winery, one of the largest in the Balkans,

[10] UN Women North Macedonia, Gender Assessment of the Agriculture and Rural Development Sector (Skopje, 2022), p. 14.

[11] SSO, Regions of the Republic of North Macedonia 2025 (Skopje, 2025), Pelagonija indicators.

[12] MAFWE, Irrigation Sector Study (2022), p. 23.

[13] UNDP, Climate Risk Profile: North Macedonia (Bratislava, 2022).

[14] SSO, Regions of the Republic of North Macedonia 2025 (Skopje, 2025), Vardar regional indicators; 2021 Census population 138,722 (SSO).

accounts for approximately 60 per cent of national wine exports.[15] Tobacco, peppers, tomatoes, table grapes, and stone fruit are the other principal crops, supported by the region's Mediterranean-influenced microclimate and the fertile alluvial soils of the middle Vardar valley.

The Vardar Region's water profile is dual-faceted. The Vardar River and its tributaries provide a substantial bulk water resource, but actual water availability for agriculture is constrained by ageing irrigation infrastructure, declining water quality due to upstream pollution loads, and growing competition between agricultural and energy uses (the Negotino thermal power plant and the Dubrovo electricity hub are located within the region). Climate-related drought stress is significant, particularly in the lower-elevation viticultural zones, where rising summer temperatures and shifting precipitation patterns are documented to be reducing optimal grape ripening windows. Rural tourism potential is anchored on the Tikveš wine route, the Demir Kapija canyon, and archaeological sites along the central Vardar valley, but rural accommodation capacity remains under-developed and digital marketing presence is limited.

Demographic vulnerability is the region's most acute structural challenge. Low population density, steady outmigration of young workers, and an ageing rural labour force collectively threaten the long-term viability of agricultural production at current scale. Women's representation in formal land ownership and cooperative governance follows the broader national pattern of structural exclusion, but is moderately better than in Polog. The Harvesting Hope project's emphasis on low-cost, locally maintainable water and food production technologies aligns directly with the resilience needs of dispersed rural settlements where labour and capital are both scarce.

3.4 Southeast Region

The Southeast Region, anchored by the city of Strumica and extending across the Strumica–Radoviš and Gevgelija–Valandovo basins, covers approximately 2,739 km² with a population of around 148,000.[16] The region comprises ten municipalities including Strumica, Radoviš, Gevgelija, Valandovo, Bogdanci, Bosilovo, Vasilevo, Konce, Novo Selo, and Dojran. With approximately 230 sunny days per year, the Southeast is North Macedonia's sunniest region, with long hot summers and mild dry winters of strong Mediterranean character.

The Southeast Region is widely recognised as the country's agricultural capital. It contains 120,583 hectares of agricultural land, of which 56,907 hectares are arable, accounting for 9.5 per cent of the national agricultural area. The region is the largest national producer and exporter of early vegetables, fresh produce (peppers, tomatoes, cucumbers, watermelons, cabbages), fruits, and industrial crops such as tobacco. With approximately 4,408 hectares of vineyards, the Southeast is the country's second-largest wine production area after Vardar.[17] The region accounts for approximately 9.7 per cent of national GDP and historically reports relatively low unemployment rates compared to other regions, reflecting the labour-intensive character of its vegetable production complex.

Despite this productive strength, the region faces specific water and environmental pressures. The Strumica River and the irrigation infrastructure of the Strumica plain are under increasing stress due to intensive agricultural water demand, summer low flows, and competition with municipal supply. Pesticide and fertiliser intensity is among the highest in the country in the early-vegetable production zones, with documented impacts on water quality and soil chemistry. Climate change risk is acute: the

[15] Vardar Planning Region Development Centre, Regional Profile (Veles, 2024); SSO data on viticulture, with the Vardar Region accounting for approximately 45 per cent of the national vineyard area.

[16] SSO, Regions of the Republic of North Macedonia 2025 (Skopje, 2025), Southeast Region indicators; Centre for Development of the Southeast Planning Region, Regional Profile (Strumica, 2024).

[17] Southeast Planning Region Development Centre, Regional Profile (Strumica, 2024); SSO Statistical Yearbook 2025 (vineyard area, agricultural land).

same Mediterranean character that supports the region's productive advantage also exposes it to lengthening dry spells and rising heat stress, both of which have measurable implications for production stability and worker health.

Rural tourism assets are concentrated and well-known: Lake Dojran, the Smolare and Koleshino waterfalls, the Bansko and Negorski thermal spa areas, and the internationally recognised Strumica Carnival are major draws for both domestic and regional visitors. Nevertheless, rural accommodation capacity outside the established spa centres is limited, and integration of rural tourism with the region's distinctive agricultural production identity (early vegetables, wine, traditional preserves) remains insufficiently developed. Women's role in vegetable production and processing is significant, particularly in the small-scale preserve and pickle production segment, but formal cooperative leadership and rural enterprise registration by women remain low.

3.5 Eastern Region

The Eastern Region covers approximately 3,537 km², with a population of approximately 175,000 centred on Štip, and extending to Vinica, Berovo, Delčevo, and Zrnovci.[18] The region borders Bulgaria and has traditionally combined tobacco, wheat, and more recently viticulture and stone fruit production. It has the highest rate of rural poverty in North Macedonia, with poverty rates in rural sub-areas estimated at 30 to 35 per cent,[19] concentrated among Roma communities, elderly single-member households, and female-headed households with no off-farm income.

Water scarcity is the defining agricultural constraint in the Eastern Region. Average annual precipitation of approximately 450 to 500 mm is the lowest of the five regions, and the Bregalnica catchment is increasingly subject to low-flow periods that limit irrigation availability. The majority of smallholders rely entirely on rain-fed farming, making them directly and severely exposed to drought risk with virtually no buffering capacity.

4. Agriculture: Productivity, Livelihoods, and Key Challenges

4.1 Structural Profile

According to the 2020 Agricultural Census, North Macedonia counted approximately 146,000 agricultural holdings, of which over 95 per cent are family farms.[20] Total utilised agricultural area is approximately 380,000 hectares, representing 48 per cent of total land area, though productive use is significantly lower due to abandonment, degradation, and fragmentation. The next comprehensive census is scheduled for 2030 under the EU Farm Structure Survey cycle; in the interim, the SSO Statistical Yearbook 2025 provides annual updates on cultivated area, livestock, and farm activity.

Agricultural productivity measured by value added per worker remains significantly below EU averages, at approximately EUR 3,200 to EUR 3,800 per agricultural worker (author's estimate based on World Bank and SSO national accounts),[21] compared to an EU-27 average exceeding EUR 20,000. Figure 3 shows the productivity gap relative to the Western Balkans regional average and the EU-27. This productivity gap reflects the compounding effects of farm fragmentation, low mechanisation, limited irrigation, poor market linkages, and inadequate advisory services. It is also partly a measurement artefact: a significant share of agricultural output, particularly that managed by women, is

[18] SSO, Regions of the Republic of North Macedonia 2025 (Skopje, 2025), Eastern Region indicators.

[19] World Bank, Poverty and Equity Brief: North Macedonia (Washington D.C., 2024).

[20] SSO, Census of Agriculture 2020: Key Results (Skopje, 2021), Table 3.

[21] World Bank, North Macedonia: Agriculture Sector Review (Washington D.C., 2022), p. 17; figures consistent with FAO TEF rural employment statistics 2024.

consumed within the household or traded informally and thus does not fully appear in national accounts.

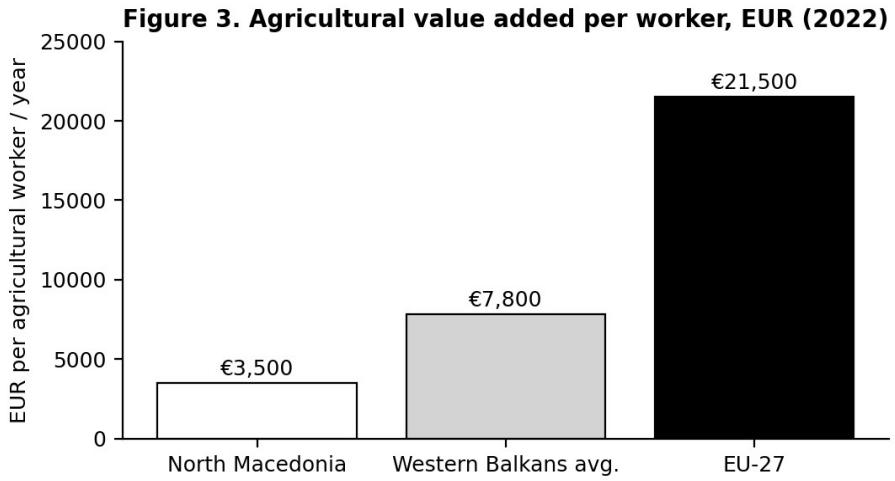


Figure 3. Agricultural value added per worker, EUR per year, comparative estimates (author, based on World Bank WDI and Eurostat 2022).

4.2 Crop and Livestock Systems in the Target Regions

Pelagonija dominates cereal production and tobacco, accounting for approximately 40 per cent of national tobacco output. Apple production in the Resen sub-region serves both domestic and export markets, though post-harvest loss is estimated at 20 to 25 per cent due to cold storage deficits.[22] Polog is the leading region for protected horticulture, with greenhouse and polytunnel pepper and vegetable production managed predominantly by smallholder family enterprises. The Vardar Region anchors the country's wine economy, with the Tikveš viticulture cluster around Kavadarci and Negotino concentrating approximately 45 per cent of the national vineyard area, alongside major tobacco, table grape, and stone fruit production. The Southeast Region is the principal national producer of early vegetables (peppers, tomatoes, cucumbers, watermelons), supplemented by significant viticulture (the country's second-largest vineyard area), tobacco, and orchard fruits, with intensive production patterns supported by the region's exceptionally sunny climate. The Eastern Region combines tobacco (a sector under increasing pressure from EU market dynamics and evolving Carbon Border Adjustment Mechanism - CBAM-adjacent regulatory signals) with fruit production and an emerging wine cluster in the Bregalnica appellation.

Small ruminant production (sheep and goat) is economically significant across all five regions, particularly as a livelihood component for lower-income households and those without irrigable land access. Animal manure, a critical input for composting and soil fertility management, is substantially underutilised as an organic fertiliser resource, representing both an environmental hazard in areas of concentrated livestock keeping and a missed circular economy opportunity at farm level.

4.3 Key Productivity Constraints

Farm fragmentation of 1.0 to 2.5 hectares average size severely limits economies of scale, mechanisation investment, and market access, and is driven by inheritance law, land market failures, and incomplete cadastral registration. Water access is the single largest production constraint: only an estimated 15 to 20 per cent of potentially irrigable land is served by functional irrigation infrastructure, leaving the remainder exposed to the increasingly erratic precipitation patterns documented in national meteorological records.

[22] FAO, North Macedonia: Country Programme Framework 2020–2024 (Rome, 2021), p. 31.

Soil degradation (erosion, salinisation from poorly managed flood irrigation, and declining organic matter content) is measurable and worsening across all five regions.[23] Input access and cost impose disproportionate burdens on smallholders, who cannot aggregate purchases to achieve the per-unit savings available to larger farms. Credit access for agricultural investment is severely constrained: agricultural loan interest rates average 6 to 9 per cent, collateral requirements are prohibitive for smallholders, and women face additional barriers as most lack independent land title against which to borrow.

The national advisory extension service has contracted significantly since the 1990s structural reforms. The ratio of extension officers to farms is estimated at 1:600 to 1:800, compared to an EU benchmark of approximately 1:100 to 1:150.[24] Digital extension tools remain underdeveloped, and the advisory service has limited outreach capacity in minority languages, creating a compounding disadvantage for the Albanian-speaking communities of Polog and the Roma communities of the Eastern and Southeast Regions.

4.4 IPARD III Implementation and Access Barriers

IPARD III (2021–2027) provides co-financing for agricultural investments in North Macedonia with a total national allocation of approximately EUR 90 million. However, the European Commission's 2024 Progress Report notes slow project pipeline development and recommends improved beneficiary outreach, simplified application procedures, and dedicated support for young farmers and women.[25]

Women's access to IPARD funds is particularly limited. A 2022 UN Women assessment estimates that women-led farm households represent fewer than 15 per cent of successful IPARD applicants,[26] despite accounting for approximately 30 to 35 per cent of agricultural labour. The primary barriers are the collateral requirement (women are far less likely to hold independent land title), as well as the administrative complexity of applications and limited outreach to women through the extension system.

4.5 Climate Change Impacts on Agriculture

North Macedonia is classified as a climate hotspot in the Mediterranean-Balkan context. Mean annual temperature has increased by approximately 1.3 °C since 1951,[27] with projections indicating a further 2.0 to 3.5 °C increase by 2080 under RCP 6.0 scenarios.[28] Figure 4 illustrates the long-term temperature anomaly trend. Precipitation patterns are shifting towards concentrated winter events followed by prolonged summer dry spells, a pattern deeply disruptive to rain-fed agriculture and poorly matched to the water storage capacity of current irrigation infrastructure. The Vardar and Southeast Regions, with their Mediterranean-influenced climates, are particularly exposed to lengthening summer drought spells, while the Eastern Region's already low rainfall is becoming more erratic.

[23] MEPP, State of Environment Report 2023 (Skopje, 2023), Chapter 4.

[24] FAO, North Macedonia: Country Programme Framework 2020–2024 (Rome, 2021), p. 22.

[25] European Commission, North Macedonia 2024 Report, SWD(2024) 693 final, Brussels, 30 October 2024, Chapter 11 (Agriculture).

[26] UN Women North Macedonia, Gender Assessment of the Agriculture and Rural Development Sector (Skopje, 2022), p. 21.

[27] IPCC, Sixth Assessment Report (AR6), WGI Chapter 12 (Geneva, 2021).

[28] World Bank, Climate Knowledge Portal: North Macedonia Country Profile, accessed February 2026.

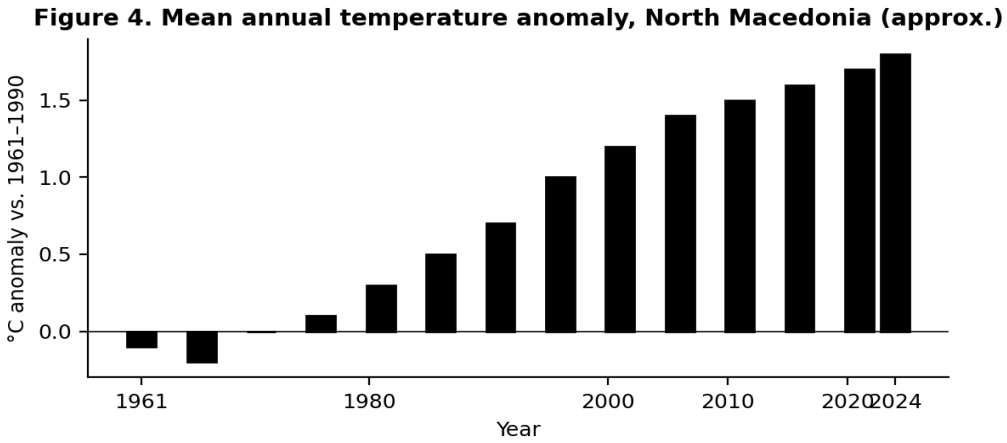


Figure 4. Mean annual temperature anomaly versus the 1961–1990 baseline, North Macedonia (illustrative trend; based on World Bank Climate Knowledge Portal and UNDP Climate Risk Profile, 2022).

Community rainwater harvesting technologies, the cornerstone of the Harvesting Hope project, are therefore not merely supplementary measures but represent a climate adaptation imperative for smallholder households across all five regions. A 5,000-litre rainwater storage system can supply approximately 60 to 80 per cent of a household kitchen garden's irrigation requirements during a 30-day dry spell, substantially reducing food security risk at near-zero recurring cost.[29]

5. Sustainable Management of Water and Land Resources

5.1 Water Governance Framework

Water governance in North Macedonia operates under the Water Law (2012, as amended 2018), which partially transposes the EU Water Framework Directive (WFD, Directive 2000/60/EC). The law establishes River Basin Management Plans, water quality classification, and the institutional framework for water use licensing. The 2024 European Commission Progress Report notes that transposition of the Water Framework Directive remains incomplete,[30] particularly regarding economic analysis of water use, environmental flow determination, and public participation in river basin planning processes.

Water User Associations are the formal institutional mechanism for managing collective irrigation infrastructure at scheme level. Their effectiveness varies significantly across regions and is constrained by ageing infrastructure, fee collection difficulties, and weak governance capacity.[31] Female participation in WUA governance is minimal and is not legally mandated, a structural gap that reinforces the broader exclusion of women from agricultural decision-making.

5.2 Irrigation Infrastructure

North Macedonia's formal irrigation systems were designed during the socialist era (1950s to 1980s) to serve approximately 125,000 to 130,000 hectares. Current functional coverage is estimated at 30,000 to 40,000 hectares, representing a utilisation deficit exceeding 70 per cent.[32] Figure 5 visualises the gap between designed and currently functional irrigation area. This deficit reflects a combination of deferred maintenance, rising operating costs, institutional fragmentation, and declining farm-level

[29]FAO / RAIN Foundation, Rainwater Harvesting for Agriculture: Technical Manual (Rome, 2018), pp. 45–52.

[30]European Commission, North Macedonia 2024 Report, SWD (2024) 693 final, p. 112.

[31]MAFWE, Assessment of Water User Associations in North Macedonia (Skopje, 2021), p. 12.

[32]MAFWE, Irrigation Sector Study (Skopje, 2022), p. 8.

demand as smallholders cannot afford irrigation fees or lack the production scale to justify the investment.

Figure 5. Irrigation infrastructure: design capacity vs. functional area

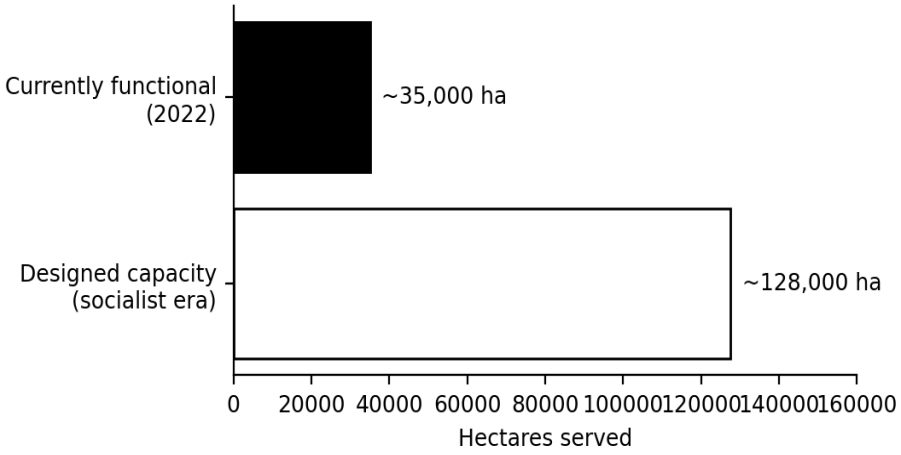


Figure 5. Designed irrigation capacity versus currently functional irrigated area, North Macedonia (MAFWE Irrigation Sector Study, 2022).

In Polog, micro-irrigation adoption is growing among commercial horticultural producers but remains inaccessible to resource-poor smallholders without subsidised technology access. The Vardar Region's irrigation challenges are concentrated in the viticulture and tobacco belts where ageing canal systems are increasingly unable to meet rising peak-summer demand. The Southeast Region has the most intensively irrigated agricultural footprint in relative terms, supporting its early-vegetable production complex; however, water demand routinely outstrips supply during the late-summer peak, with associated stress on the Strumica River system. In the Eastern Region, irrigation availability is the lowest of the five regions and the majority of farms rely entirely on rainfall, creating direct and unmitigated exposure to the increasing drought frequency documented in regional meteorological records.

5.3 Rainwater Harvesting: Evidence Base and Potential

Community-scale and household-level rainwater harvesting represents a low-cost, technologically accessible, and environmentally sound approach to supplementary irrigation and domestic water supply. The evidence base from comparable Mediterranean and Balkan contexts is robust. In southern Kosovo and north-eastern Albania, UNDP GEF Small Grants Programme-supported household RWH systems with 3,000 to 8,000-litre storage capacity reduced irrigation water demand on kitchen gardens by 50 to 80 per cent during dry seasons,[33] with an average household capital cost of EUR 380 to 500 per system.

Composting systems combined with RWH have been shown to increase kitchen garden yields by 30 to 60 per cent within the first growing season, through improved water retention in soil amended with organic matter.[34] In the North Macedonian regulatory context, no licence is required for rainwater collection from rooftops for non-drinking purposes,[35] creating a direct opportunity for rapid, low-barrier deployment under the Harvesting Hope project.

[33]UNDP GEF Small Grants Programme, Evaluation Report: Rainwater Harvesting in Kosovo and Albania (Bratislava, 2023), pp. 11–15.

[34]FAO TECA, Composting and Kitchen Gardens in Rain-Deficient Zones (Rome, 2020).

[35]Law on Waters of the Republic of North Macedonia (Official Gazette No. 87/08, as amended 2018), Article 21.

5.4 Land Governance and Tenure Security

Land tenure insecurity is a pervasive constraint on agricultural investment. An estimated 30 to 40 per cent of agricultural land is not formally registered in the cadastre,[36] with particularly high rates of informality in the Polog Region where customary land management practices prevail. Incomplete registration prevents smallholders from using land as collateral, qualifying for direct payments, or investing confidently in land improvement.

Gender dimensions of land tenure are acute. Only 21 per cent of agricultural land in North Macedonia is owned or co-owned by women,[37] and the figure is lower in Polog where customary inheritance practice is strongest. Women with insecure land tenure cannot access most agricultural credit instruments, face barriers to IPARD application, and are structurally excluded from cooperative governance that typically requires formal land ownership as a membership criterion.

5.5 Soil Health and Composting

Soil degradation is an escalating concern across all five regions. The 2023 State of Environment Report identifies water erosion affecting approximately 60 per cent of agricultural land as the primary form of degradation, with annual topsoil loss estimated at 5 to 15 tonnes per hectare in high-erosion zones.[38] Soil organic matter content has declined by an estimated 20 to 30 per cent over the past three decades, reducing water retention capacity and making soils simultaneously more vulnerable to drought and to surface runoff during intense precipitation events.

Composting directly addresses this dynamic at household and community level. Regular application of compost at 10 to 15 tonnes per hectare has been demonstrated to increase soil organic matter content by 0.3 to 0.8 percentage points per year,[39] reducing irrigation requirements, improving nutrient availability, and enhancing soil structure. Organic farming certification in North Macedonia covers fewer than 1 per cent of agricultural land as of 2024 (SSO data: 4,130 ha certified organic in 2024),[40] far below the EU Farm to Fork Strategy target of 25 per cent by 2030. The Harvesting Hope project's composting component can serve as an evidence-based 'step towards organic' entry point for participating households.

6. Rural Tourism: Development Potential and Barriers

6.1 National Context

Rural and agritourism is identified as a priority diversification pathway in the NARDS 2021–2027 and the National Tourism Strategy. North Macedonia received approximately 1.05 million international tourist arrivals in 2023; foreign arrivals reached 830,179 in 2024 (SSO; +13.1 per cent year-on-year), with foreign overnight stays increasing by 8.9 per cent. Rural and nature-based tourism constitutes a fast-growing segment supported by post-COVID shifts in traveller preferences and growing international interest in the Western Balkans as an unexplored destination.

[36] AREC, Annual Report 2023 (Skopje, 2024), p. 34.

[37] UN Women North Macedonia, Gender Assessment of the Agriculture and Rural Development Sector (Skopje, 2022), p. 9.

[38] MEPP, State of Environment Report 2023 (Skopje, 2023), Chapter 4.

[39] FAO / ITPS, Recarbonizing Global Soils: A Technical Manual (Rome, 2020), Vol. 1.

[40] MAFWE, Agricultural Statistics Bulletin 2023 (Skopje, 2023), Table 18; supplemented by SSO data: certified organic agricultural area 4,130 ha in 2024.

6.2 Tourism Assets by Region

In Polog, rural tourism potential is anchored on Mavrovo National Park, one of the country's three national parks, encompassing 73,088 hectares of mountain landscape, the Radika River canyon, and Mavrovo Lake. However, village-based accommodation capacity in rural Mavrovo consists of fewer than 200 licensed beds, with much informal capacity uncounted, reflecting a structural supply gap relative to documented visitor demand. The Šar Planina massif, with its unique high-altitude pastoral landscapes and Bektashi cultural heritage, represents an additional underdeveloped asset where the project's kitchen garden and traditional food components can directly inform agritourism product development.

In Pelagonija, rural tourism potential is concentrated in two anchor assets: the heritage mountain town of Kruševo (the highest town in the Balkans and a centre of national cultural memory), and the internationally recognised Prespa Lake wetland in the Resen sub-region, a Ramsar site shared with Greece and Albania. Apple orchards in Resen create a distinctive agricultural landscape with harvest-season agritourism potential that is documented but underrealised. The region also contains significant archaeological heritage at Heraclea Lyncestis near Bitola, and living cultural landscapes of tobacco drying barns and water mills that can anchor cultural-agricultural itineraries.

In the Vardar Region, rural tourism is dominated by the Tikveš wine route through Kavadarci and Negotino, with established cellar-door visit infrastructure at Tikveš Winery and a growing portfolio of boutique wineries offering tastings and farm-stay experiences. The Demir Kapija canyon, the central Vardar valley, and the archaeological landscape around Stobi together provide a culturally rich complementary visitor proposition. The principal constraint is the dispersed character of these attractions and the limited integration of small-scale agricultural producers into wine-tourism value chains.

In the Southeast Region, rural tourism assets are diverse and well-known. Lake Dojran, the country's smallest natural basin lake, attracts both leisure visitors and birdwatchers seeking its distinctive fish-hunting cormorant population. The Smolare Falls (39.5 metres) and Koleshino Falls in Novo Selo Municipality are flagship nature destinations. The thermal spas at Bansko (Strumica) and Negorski Bani (Gevgelija) anchor a domestic wellness tourism segment. The Strumica Carnival, held annually before Lent, is one of North Macedonia's most distinctive cultural events with strong international interest. Agritourism integration with the region's distinctive vegetable, wine, and preserved-food production is an underdeveloped but high-potential opportunity.

In the Eastern Region, the Maleshevo sub-region around Berovo, with its lake and spruce forests, constitutes a mountain resort environment popular with domestic visitors but largely unknown to international markets. An emerging wine route linking the Bregalnica appellation to the Eastern Region's smaller producers offers a growing basis for enogastronomic tourism. The region's traditional crafts, including Vinica's pottery tradition, provide additional cultural-tourism anchors that are insufficiently integrated with rural accommodation development.

6.3 Barriers to Development

Across all five regions, rural tourism development is constrained by a consistent set of structural barriers. Infrastructure deficits, including poor rural road quality, unreliable broadband, and absence of wastewater treatment in rural settlements, cap accommodation expansion and visitor experience quality. Product development capacity is limited: rural accommodation and agritourism providers lack digital marketing skills, platform presence, and the ability to package multi-day itineraries that can compete in regional markets.

The integration of local agricultural production with rural tourism catering and retail is nascent and largely informal. Women's role in rural tourism is significant but systematically underrecognised: internationally, women manage approximately 60 to 70 per cent of rural accommodation and hospitality enterprises in comparable mountain contexts,[41] yet in North Macedonia, rural accommodation enterprises formally registered by women are estimated at below 20 per cent, reflecting structural barriers to business registration, finance access, and intra-household decision-making authority.

7. Women, Gender Equality, and Social Inclusion in Rural Development

7.1 Legal and Policy Framework

North Macedonia has ratified the UN Convention on the Elimination of All Forms of Discrimination Against Women and the Istanbul Convention, and the Law on Equal Opportunities for Women and Men (2012) provides the national gender equality framework. The NARDS 2021–2027 includes gender equality as a cross-cutting priority, and the EU Gender Equality Strategy 2020–2025 and SDG 5 provide the external normative architecture.

Despite this framework, a 2023 UNDP Gender Assessment found that gender-responsive budgeting is weakly applied in the agriculture and rural development sector, with fewer than 30 per cent of MAFWE budget lines tagged by gender relevance.[42] IPARD III programme documentation acknowledges gender equity as an objective but lacks specific targets, monitoring indicators, or differentiated support instruments for women applicants.

7.2 Women's Agricultural Labour and Agency

Women constitute approximately 44 per cent of the agricultural labour force but own only 21 per cent of agricultural land and represent fewer than 25 per cent of formal farm decision-makers.[43] Figure 6 brings these indicators together to show the consistent gap between women's labour contribution and their formal voice in the sector. The unpaid care work dimension is critical: rural women in North Macedonia spend an estimated four to six additional hours per day on domestic and care responsibilities compared to rural men,[44] fundamentally limiting their capacity to engage in paid agricultural or off-farm work, access training, or participate in cooperative governance.

[41] ILO, Women's Entrepreneurship Development in Rural Hospitality: ILO Guidance Note (Geneva, 2022), p. 6.

[42] UNDP North Macedonia, Gender and Environment Assessment (Skopje, 2023), p. 19.

[43] UN Women North Macedonia, Gender Assessment of the Agriculture and Rural Development Sector (Skopje, 2022), p. 9. Of 175,088 holdings registered in the Single Register (2020), 38,328 (21.9 %) are headed by women.

[44] SSO, Time Use Survey 2018–2019 (Skopje, 2019), p. 27.

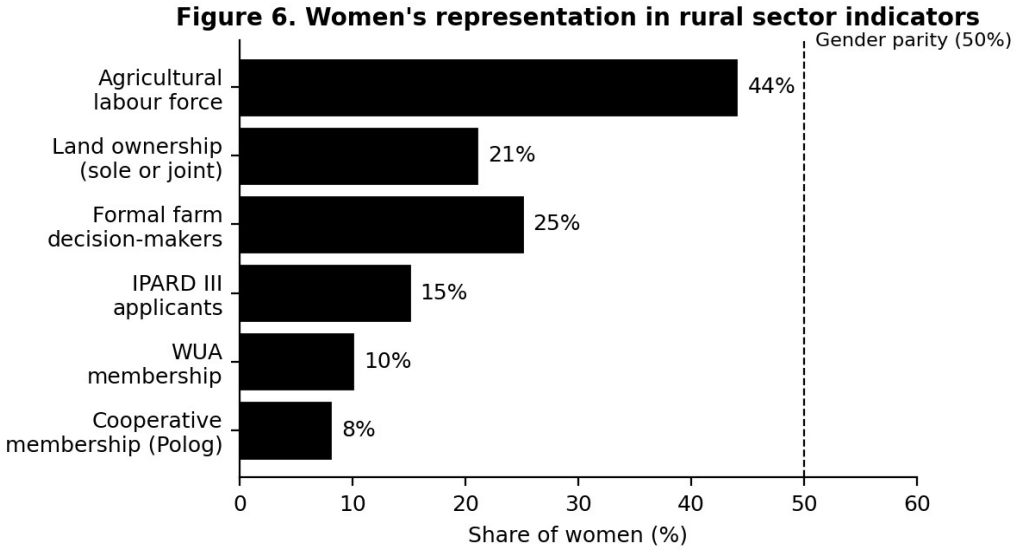


Figure 6. Women's representation across rural sector indicators in North Macedonia (UN Women, 2022; SSO Census of Agriculture 2020; MAFWE administrative data).

Kitchen and community gardens, as promoted by the Harvesting Hope project, are predominantly managed by women in North Macedonian rural contexts. This alignment between traditional female agricultural roles and the project's technology focus is a direct pathway to women's agency: enhanced productivity in a domain woman already control generates measurable improvements in household food security and income without requiring a transfer of authority in culturally contested spheres.

Women's exclusion from rural finance is the most consequential downstream effect of unequal land tenure. Because most agricultural credit instruments require formal land title as collateral, the 21 per cent female land-ownership share translates into a comparable or lower share of women among formal agricultural borrowers, with secondary effects on women's eligibility for IPARD co-financing (which itself requires demonstrated investment capacity), for organic-conversion premiums (which require continuous landholder commitment over a multi-year transition window), and for the emerging green-lending instruments described in section 8.5 of this study (which will require documented climate-resilient practice on bankable land). Women without formal land title are thus simultaneously excluded from the conventional credit market, the EU pre-accession co-financing architecture, and the green-finance market that the National Bank's climate risk framework will progressively bring into the mainstream. Each new layer of credit product, in the absence of deliberate gender-responsive design, reproduces the original tenure-based exclusion at a higher capital volume.

Time poverty compounds these structural barriers in ways that are rarely captured in conventional rural development indicators. The four-to-six-hour daily gap in unpaid care and domestic work between rural women and rural men translates into systematically lower attendance at extension training events (which tend to be scheduled in the morning, when women's care responsibilities peak), lower digital literacy rates among women (who have less time for self-directed learning), and lower rates of participation in cooperative governance meetings (which are typically held in the evening at venues with no childcare). The Harvesting Hope project's investment in time-saving water and food production technologies—a 5,000-litre rainwater harvesting system can save a household two to three hours per day of water-fetching during dry spells, almost all of which is currently performed by women and girls—directly addresses this compounding constraint and creates the temporal preconditions for women's substantive participation in cooperative, savings, and advocacy structures.

Customary inheritance practice in many of the rural communities surveyed, under which female heirs voluntarily cede their statutory inheritance share to male siblings in exchange for a residual claim on

family hospitality and informal access to natal-family resources, is the single most direct mechanism through which formal gender-equal inheritance law is converted into de facto male land monopoly. The practice is most pronounced in the mountain communities of Polog and parts of the Eastern Region but is observable across all five target regions. It is legally voluntary but socially compulsory, and its quantitative impact is visible in the disparity between women's nominal inheritance entitlements (50 per cent under statutory law) and the documented 21 per cent female land-ownership outcome. Addressing this conversion mechanism requires not only legal awareness raising but also the creation of socially acceptable alternatives, for example joint title registration at the moment of inheritance, recognition of women's labour contribution in formal cadastral records, and community-level dialogue with religious and customary authorities. The Harvesting Hope project, working through women-led community garden groups, can serve as a culturally calibrated entry point for such dialogue, particularly where it positions women's enhanced productivity (and household food contribution) as a basis for revisiting tenure arrangements.

Intersectional vulnerability deserves explicit attention. Roma women, women in female-headed households without male relatives, and elderly single women face barriers that are not the simple sum of their separate identity-based exclusions but are qualitatively different. Roma women in the Eastern and Southeast Regions are more likely to lack personal identification documents required for any cooperative or financial transaction, and are more likely to be in informal common-law unions whose dissolution leaves them with no documented claim to family land. Female-headed households (estimated at 12 to 15 per cent of rural households in the five target regions, concentrated in Pelagonija and Vardar where outmigration of working-age men is highest) report the lowest agricultural mechanisation rates and the highest rates of land abandonment. Elderly single women are the demographic most acutely exposed to the combination of climate stress, declining extension service reach, and digital exclusion. Each of these subgroups requires differentiated outreach in the project's beneficiary identification process, and the project's gender-disaggregated monitoring system should track outcomes across them rather than reporting only an aggregate “women beneficiaries” figure that conceals these distinctions.

7.3 Marginalised Groups

The Eastern and Southeast Regions contain significant rural Roma communities, particularly in the Šuto Orizari, Strumica, and Radoviš sub-areas. Roma communities face compounding vulnerabilities: the highest rates of land informality, limited access to formal agricultural support programmes due to documentation barriers and language gaps, and systematic exclusion from cooperative governance.[45] Climate shocks fall most heavily on Roma smallholders due to near-zero adaptive capacity, making them both the most vulnerable and the most urgent beneficiary group for climate-adaptive water technologies.

The Polog Region's predominantly Albanian-speaking rural communities face specific linguistic and cultural barriers to accessing national agricultural support programmes. Extension materials and IPARD documentation are predominantly available in Macedonian only, and MAFWE's advisory service has limited capacity for Albanian-language outreach. Elderly farmers, increasingly the majority of the agricultural labour force in Pelagonija, the Vardar Region, and the Eastern Region, face specific barriers to technology adoption and digital access, requiring age-appropriate delivery modalities such as peer-to-peer Farmer Field Schools rather than classroom-based instruction. The Vardar Region also contains a significant Bosniak rural community in the Veles sub-area, and the Southeast Region a long-established Turkish rural community in the Strumica–Valandovo zone, both of which warrant explicitly multilingual outreach in project communication materials.

[45] World Bank, Poverty and Equity Brief: North Macedonia (Washington D.C., 2024).

7.4 Gender-Transformative Approaches

A substantial body of international evidence demonstrates that gender-transformative approaches in water and land management, those that actively restructure unequal gender norms rather than merely accommodating them, generate significantly better long-term outcomes for both agricultural productivity and women's empowerment. Evidence specific to smallholder Mediterranean and Balkan contexts shows that women's participation in WUA governance improves irrigation maintenance compliance; that joint land titling increases women's investment in land improvement and adoption of conservation practices; and that women-led savings and credit groups achieve higher repayment rates and broader community investment than comparable mixed or male-led groups.[46]

8. Alignment with EU and UN Frameworks: Status Assessment

8.1 EU Pre-Accession Framework

North Macedonia's EU accession process places substantial obligations on the country in the agriculture and rural development domain. Chapter 11 (Agriculture and Rural Development) and Chapter 27 (Environment) of the EU acquis are among the most technically demanding. The 2024 EC Progress Report assesses agriculture alignment as 'moderately advanced' and identifies a series of specific implementation gaps.[47]

On IPARD III, the Commission notes slow project pipeline development and recommends improved beneficiary outreach, simplified application procedures, and dedicated support for young farmers and women. On agri-environment-climate measures, implementation remains nascent: no Agri-Environment-Climate Payment scheme has been operationalised under IPARD III, representing a significant gap given the sector's documented climate vulnerability, and a direct area where community-level initiatives like Harvesting Hope can pre-position North Macedonia for future programme development. On organic farming, the Commission recommends accelerated investment in certification infrastructure and farmer advisory services for organic conversion. On the Water Framework Directive, the Commission recommends prioritising River Basin Management Plan implementation, economic analysis of water use, and environmental flow determination, which, in the medium term, implies increasing water metering, pricing, and volumetric allocation that will strengthen the economic case for water-efficient farm-level technologies.

8.2 UN Sustainable Development Goals: Progress Assessment

Table 1 below summarises North Macedonia's status against the SDGs most relevant to rural water, land, agriculture, and gender outcomes. Figure 7 visualises the indicative progress toward each goal.

SDG	Target Area	Status in NMK Rural Sector	Key Gap
SDG 2	Zero Hunger	Food insecurity affects approx. 22% of rural households. Kitchen gardens common but low-productivity.	Scale RWH and composting to raise kitchen garden output for food-insecure HHs.
SDG 5	Gender Equality	Women own 21% of agricultural land; <15% of IPARD applicants; WUA female membership <10%.	Joint land titling; women-only advisory outreach; gender targets in IPARD.
SDG 6	Clean Water	65% of rural HHs have piped water access; agricultural water use efficiency low; WFD transposition incomplete.	RWH deployment; WUA reform with gender inclusion; WFD acceleration.
SDG 13	Climate Action	National Adaptation Plan under development (unclear farm level	IPARD agri-environment-climate measure; RWH as adaptation; farm-

[46] FAO / CGIAR / IWMI, Gender-Transformative Approaches in Water and Land Management: Evidence Review (Rome, 2021), pp. 4–9.

[47] European Commission, North Macedonia 2024 Report, SWD (2024) 693 final, pp. 80–85.

		interventions planning)	level climate advisory.
SDG 15	Life on Land	Organic farmland <1%; soil erosion widespread; agrobiodiversity in decline.	Composting and soil restoration; organic conversion support; agri-environment payments.

Table 1. SDG Alignment Assessment, North Macedonia Rural Sector (Author's assessment, 2026).

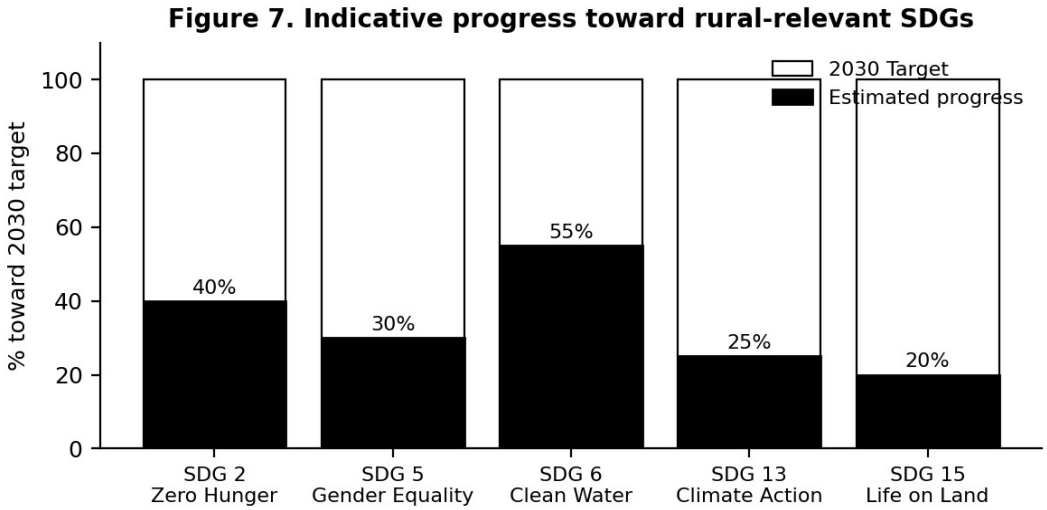


Figure 7. Indicative progress toward rural-relevant SDG targets, North Macedonia (author, based on UN VNR 2022 and SSO 2024 data).

8.3 Western Balkans Green Agenda

The Western Balkans Green Agenda (WBGA), adopted at the Sofia Summit in November 2020, commits North Macedonia to climate neutrality, clean energy, sustainable food systems, and circular economy pathways aligned with the EU Green Deal.[48] The WBGA Agriculture and Food chapter calls for reductions in synthetic fertiliser use, methane and nitrous oxide emissions from livestock, and food waste, alongside increases in organic farming and biodiversity-friendly practices. North Macedonia's WBGA implementation in agriculture remains nascent: no Farm to Fork-aligned national strategy has been adopted, though elements are incorporated in the NARDS 2021–2027. The Harvesting Hope project's composting and organic waste valorisation components are directly consistent with WBGA circular economy commitments and can be cited in national WBGA implementation reporting as community-level evidence of measurable progress.

8.4 The EU Growth Plan for the Western Balkans: North Macedonia's Reform Agenda

The EU Growth Plan for the Western Balkans, adopted by the European Commission in November 2023 and operationalised in 2024, represents a paradigm shift in the EU's pre-accession support architecture. The Growth Plan provides up to EUR 6 billion in grants and investment support to accelerate socio-economic convergence with the EU, deepen regional economic integration, and fast-track fundamental reforms across six Western Balkan partners. Unlike traditional IPA programming, the Growth Plan front-loads financial support in exchange for demonstrable progress on a country-specific Reform Agenda negotiated between each beneficiary government and the Commission.

North Macedonia's Reform Agenda under the Growth Plan, endorsed by the Commission in March 2024, identifies four priority pillars: functioning market economy and competitiveness; green and digital transition; EU integration of the common regional market; and fundamental reforms in public

[48]Western Balkans Green Agenda, Sofia Declaration on the Green Agenda for the Western Balkans, Sofia, November 2020.

administration, rule of law, and the fight against corruption. The green transition pillar includes explicit commitments on climate adaptation in agriculture, water resource management aligned with the Water Framework Directive, renewable energy deployment in rural areas, and circular economy principles in agricultural waste management.

The relevance of the Growth Plan to this study's subject matter is direct and structural. First, the Reform Agenda commits North Macedonia to completing Water Framework Directive transposition by 2027, a deadline that has repeatedly slipped in previous programming cycles. Field data from this study reveal that smallholder water security is the most acute rural development constraint across all five target regions, with water urgency ratings ranging from 2 out of 5 (Trebište, seasonal stress) to 5 out of 5 (Koreshnica, where high municipal water fees combine with the paradox of existing roof gutters discharging all captured rainwater directly into the atmospheric sewer). The Growth Plan's accelerated WFD timeline creates both pressure and opportunity: pressure to deliver institutional reform, but opportunity to embed community-based water solutions such as rainwater harvesting as complementary instruments within the formal water governance framework rather than as marginal, donor-dependent pilot initiatives.

Second, the Reform Agenda sets a target of doubling the area under organic farming certification from approximately 4,000 hectares in 2024 to 8,000 hectares by 2027, with a longer-term trajectory toward the EU Farm to Fork Strategy target of 25 per cent of agricultural land under organic management by 2030. The universal finding from field interviews that zero chemical pesticides are used across all four visited communities, spanning mountain, plain, and valley agro-ecological zones, reveals that North Macedonia possesses a substantial de facto organic production baseline that is unrecognised, uncertified, and unmonetised. The Harvesting Hope project's composting training component, combined with documentation of existing pesticide-free practice, creates a scalable pathway for transitioning participating households from informal organic production to certified organic status, directly supporting the Reform Agenda target while generating premium market access and higher per-unit returns for smallholders.

Third, the Growth Plan's digital transition pillar includes commitments on rural broadband coverage expansion and digitalisation of public services, with specific reference to agricultural extension and advisory services. Field data document that permaculture is unknown to all respondents across all four villages and composting practice ranges from zero to 20 per cent, indicating that the national agricultural extension system has failed to reach smallholders with even basic soil health management knowledge. The Growth Plan's digital transition investment creates infrastructure capacity for app-based extension, video tutorials, and group-based advisory delivery via messaging platforms that can overcome the current 1:600 to 1:800 extension officer-to-farm ratio. The Harvesting Hope project's Farmer Field School model and peer knowledge-sharing networks prefigure the community-based delivery modality that Growth Plan-financed digital extension platforms would require to achieve effective last-mile reach.

Fourth, the Reform Agenda's competitiveness pillar includes commitments on agricultural value chain development, market integration, and support for women's entrepreneurship. The study's expanded analysis of rural tourism potential, documenting wine tourism in the Tikveš corridor, nature and spa tourism in the Southeast, and mountain and heritage tourism in Polog and Pelagonija, identifies income diversification pathways beyond subsistence agriculture that are particularly accessible to women-led households. The Growth Plan's investment in rural road quality, wastewater treatment infrastructure, and rural accommodation certification can remove the structural barriers to tourism development documented in section 6.6, while the Harvesting Hope project's community garden groups provide the local agricultural production base that wine cellars, rural guesthouses, and agritourism enterprises require to develop farm-to-table and locally sourced catering products.

The financial architecture of the Growth Plan introduces performance-based disbursement: tranches of funding are released contingent on verified progress against Reform Agenda milestones. This creates a documentation imperative. The Harvesting Hope project's monitoring and evaluation system, if designed to generate quantifiable, auditable evidence on water savings, soil organic matter increases, women's time liberation, and household food security improvements, can feed directly into North Macedonia's Growth Plan implementation reporting. Community-level outcomes become national-level evidence, strengthening the credibility of government claims regarding reform momentum and accelerating disbursement timelines.

The European Commission's first annual assessment of North Macedonia's Reform Agenda implementation is scheduled for mid-2025. The findings documented in this study, including the zero rainwater harvesting baseline, the composting knowledge gap, the women's water burden exceeding SDG thresholds, and the untapped organic certification potential of pesticide-free communities, provide a transparent baseline against which project-driven change can be measured and reported as tangible progress within the Growth Plan results framework. This positions the Harvesting Hope initiative not as a standalone civil society project but as a strategic contribution to North Macedonia's EU accession trajectory under the most consequential pre-accession financing mechanism the Commission has designed to date.

8.5 Climate Risk Integration in the Financial Sector: Implications for Rural Climate Financing

The National Bank of the Republic of North Macedonia (NBRNM), in alignment with the Network for Greening the Financial System (NGFS) principles and as part of the country's Western Balkans Green Agenda commitments, has commenced integration of climate-related financial risk into its supervisory framework. In 2023, the NBRNM issued its Guidelines on Managing Climate-Related Risks for the banking sector, requiring commercial banks to assess and disclose climate-related risks in their lending portfolios, with particular attention to sectors identified as climate-vulnerable, including agriculture, forestry, and water-intensive industries.[49] The 2024 Financial Stability Report dedicated a full chapter to climate risk exposure in the domestic banking system, noting that approximately 18 to 22 per cent of total bank lending is concentrated in climate-sensitive sectors, with agriculture accounting for an estimated EUR 280 to 320 million of outstanding credit as of December 2023.[50]

The NBRNM's climate risk framework introduces two categories of relevance to rural development financing: physical risk (the direct impact of climate events such as drought, flooding, and extreme temperatures on borrower repayment capacity) and transition risk (the financial impact of policy, regulatory, and market shifts toward a low-carbon economy on asset values and business models). For smallholder farmers in the five target regions of this study, both risk categories translate into tightening credit conditions. Physical climate risk manifests in the planting calendar shifts of three weeks to two months documented in field interviews, the increasing drought frequency affecting the Vardar and Southeast Regions, and the snowpack decline threatening water security in Polog mountain communities. These measurable climate impacts reduce the bankability of traditional rain-fed and flood-irrigated smallholder agriculture, as lenders price in higher default probability during climate shock years.

Transition risk operates more subtly but with equally constraining effects. As North Macedonia progresses toward EU accession and operationalises the Carbon Border Adjustment Mechanism's implications for agricultural exports, banks are beginning to assess the carbon intensity and

[49] National Bank of the Republic of North Macedonia (NBRNM), Guidelines on Managing Climate-Related Risks (Skopje, 2023).

[50] NBRNM, Financial Stability Report 2024 (Skopje, 2024), Chapter 4: Climate-Related Financial Risk.

environmental compliance profile of agricultural borrowers. Smallholder farmers using flood irrigation, applying synthetic fertilisers without soil testing, and lacking any documented climate adaptation measures face increasing difficulty accessing credit at competitive rates, as banks classify such operations as transition-vulnerable. Conversely, farms demonstrating measurable climate adaptation, water efficiency, and soil carbon enhancement are increasingly positioned as lower-risk borrowers under emerging green lending frameworks.

This dynamic creates both a barrier and an opportunity for the Harvesting Hope project beneficiaries. The barrier is immediate: the women smallholders and resource-poor households targeted by the project are systematically excluded from formal agricultural credit markets due to lack of collateral, informal land tenure, and the perceived high risk of their small-scale, climate-exposed operations. The NBRNM's climate risk framework, if implemented without complementary pro-poor safeguards, risks deepening this exclusion by adding an additional layer of risk assessment that smallholders cannot meet.

The opportunity, however, is structural and forward-looking. The project's rainwater harvesting, composting, and climate-smart kitchen garden interventions generate quantifiable, verifiable climate adaptation metrics that align precisely with the criteria banks will use to assess borrower climate resilience under the NBRNM framework. A household with a functional 5,000-litre rainwater storage system reducing irrigation water demand by 60 per cent, documented composting practice increasing soil organic matter by 0.5 percentage points per year, and a diversified kitchen garden reducing food expenditure by EUR 150 to 250 annually presents a measurably lower physical climate risk profile than a comparable household dependent entirely on erratic rainfall and degraded soils. These are not speculative benefits; they are the documented outcomes from comparable UNDP GEF-supported RWH programmes in Kosovo and Albania cited in section 10.1 of this study.

Furthermore, the NBRNM's 2024 Guidelines on Green Lending, issued in draft form for public consultation, propose preferential reserve requirements and potential concessional refinancing windows for commercial bank lending to climate adaptation and mitigation projects in priority sectors, including smallholder agriculture.[51] The guidelines define eligible green lending categories including water efficiency investments, soil carbon enhancement, and renewable energy deployment. Rainwater harvesting systems, composting infrastructure, and organic farming transitions all fall within these definitions. If the Harvesting Hope project documents its outcomes in a format compatible with the NBRNM's green lending criteria—quantified water savings, measured soil organic matter increases, verifiable reductions in synthetic input dependency—it creates a replicable model that financial institutions can recognise, appraise, and finance at scale.

This requires deliberate design. The project's monitoring and evaluation framework should incorporate climate metrics that mirror the NBRNM's supervisory expectations: baseline and endline measurements of water use per hectare, soil organic carbon content, crop yield stability across variable rainfall years, and household food security indicators. These metrics, aggregated across project beneficiaries and presented in a standardised format, become bankable evidence of climate resilience that participating households can use to demonstrate creditworthiness in future green lending applications. Community garden groups established under the project, if formalised as savings and loan associations or cooperatives, can aggregate individual household climate performance data into collective borrowing profiles that meet the minimum ticket size and administrative capacity thresholds commercial banks require.

The gender dimension of this financial-sector shift is acute. Women smallholders, who hold only 21 per cent of agricultural land in their own name and are therefore disproportionately reliant on informal or

[51] NBRNM, Draft Guidelines on Green Lending (Skopje, 2024), public consultation document.

undocumented land use, face a double exclusion: from the conventional collateral-based credit market by virtue of their tenure status, and from the emerging green-finance market by virtue of their inability to evidence formally certified climate-resilient practice on land they do not legally control. Without targeted instruments, the green-lending architecture risks reproducing pre-existing gender inequities in credit access at higher capital volumes. The Harvesting Hope project can mitigate this risk by registering household-level climate adaptation outcomes under the name of the woman managing the system regardless of formal land title, and by aggregating women smallholders into VSLA-style groups whose collective climate performance becomes the basis for joint borrowing profiles. This approach is consistent with the gender-responsive finance recommendations of the Network for Greening the Financial System and creates a documented evidence base that gender-lens green-lending pilots can build upon.

The timing is opportune. The NBRNM's green lending framework is at the consultation stage, creating a policy window in which evidence from the Harvesting Hope project can inform the detailed design of eligibility criteria, documentation requirements, and appraisal methodologies. The European Bank for Reconstruction and Development and the World Bank are both engaging with the NBRNM on technical assistance for green finance instrument design, and both institutions have expressed interest in piloting results-based financing and gender-lens investing in the agriculture sector. The Harvesting Hope project, if positioned as a proof-of-concept for community-scale climate finance in smallholder agriculture, aligns with this international financial institution interest and can serve as a demonstration case for scaling through blended finance mechanisms that combine donor grant capital, concessional loans from development finance institutions, and commercial bank co-financing under the NBRNM's preferential green lending windows.

In summary, the National Bank's integration of climate risk into the financial sector regulatory framework represents both a tightening constraint on smallholder credit access and a strategic opening for innovative climate finance mechanisms that reward demonstrated adaptation and mitigation outcomes. The Harvesting Hope project sits at this intersection. Its success in generating verifiable, quantifiable climate resilience metrics at household and community level can catalyse a shift from exclusionary risk-based lending to inclusive performance-based financing, transforming climate risk assessment from a barrier into an enabling condition for pro-poor rural finance at scale.

9. SWOT and PESTLE Analysis

9.1 SWOT Analysis

Table 2 presents the SWOT analysis structured around the four standard quadrants.

STRENGTHS	WEAKNESSES
Rich agricultural tradition and localised knowledge systems; significant natural water resources in mountain zones; existing WUA structures; growing organic farming interest; established wine and vegetable export complexes (Vardar, Southeast); diaspora remittance flows available for micro-investment; young demographic profile in Polog; IPARD III accreditation in place; high smartphone penetration enabling digital extension.	Severely fragmented land holdings; degraded irrigation infrastructure with 70% utilisation deficit; incomplete WFD transposition; low women's land ownership (21%); contracting agricultural extension service; limited climate-smart technology access for smallholders; chronic rural income deficit; insufficient digital connectivity in mountain and eastern areas; pesticide and fertiliser intensity in vegetable belts.
OPPORTUNITIES	**THREATS**
EU accession agenda driving regulatory upgrade; IPARD III co-financing available; growing EU demand for organic and specialty products; rural and wine tourism growth trajectory; RWH technology accessible, affordable and legally unencumbered; Green Agenda alignment; diaspora and civil society engagement; LEADER/CLLD as local	Accelerating climate change (drought, heat stress, flash flooding); accelerating rural outmigration and demographic ageing; rising input costs and energy prices; CBAM pressure on export-oriented producers; land market dysfunction; insufficient public investment in rural infrastructure; potential water rights conflicts under WFD

mobilisation tools; international donor interest in climate-gender nexus.	implementation; political fragmentation at local government level.

Table 2. SWOT Analysis, Rural Water, Land, and Agriculture in the Five Regions (Author, 2026).

9.2 PESTLE Analysis

Table 3 presents the PESTLE analysis of the rural development enabling environment.

Factor	Analysis
Political	EU accession creates reform incentives but introduces political complexity. Decentralisation remains incomplete, leaving municipalities without sufficient revenue or technical capacity for autonomous rural development planning. The 2024 parliamentary elections introduced a new government coalition whose agricultural policy priorities are still being operationalised.
Economic	GDP growth of 2 to 3 per cent per annum is insufficient to close the income gap with the EU. High inflation in 2022 and 2023 eroded rural purchasing power and raised input costs significantly. The agricultural credit market is weak, with a rural finance gap estimated at EUR 120 to 150 million. Diaspora remittances of approximately three to five per cent of GDP provide an informal rural safety net but are not systematically channeled into productive agricultural investment.
Social	Rural outmigration is structural and accelerating. Demographic projections suggest Pelagonija, the Vardar Region, and the Eastern Region will lose 20 to 30 per cent of rural population by 2040. The agricultural labour force is simultaneously ageing and remains in increasingly in the hands of women. Social capital in rural communities remains significant (mutual aid traditions are observable) but is eroding. Ethnic and linguistic diversity (Albanian in Polog, Bosniak and Turkish in Vardar and Southeast, Roma in Southeast and Eastern) requires culturally sensitive extension and community engagement.
Technological	Smartphone penetration is high even in rural areas (70 to 80 per cent), creating viable digital extension opportunities. Precision agriculture technologies remain beyond smallholder reach, but community-level accessible tools (low-cost soil sensors, weather applications, group-based extension via messaging platforms) are feasible at scale. RWH and composting technologies are mature, proven, locally replicable, and maintainable without specialised skills. Solar-powered water pumping is increasingly cost-competitive in the energy context.
Legal	Land law reform is ongoing but slow. The Water Law is partially EU-aligned. IPARD legal framework is established. No legal barriers exist to household rainwater harvesting from rooftops for non-drinking use. The gender equality framework is in place but weakly enforced in the property rights domain. Organic farming legislation is partially aligned with EU Regulation 2018/848. WBGA implementation is legally anchored through EU accession obligations.
Environmental	Climate change is the paramount environmental driver: documented temperature increase, increasing drought frequency, and intensifying precipitation events are reducing agricultural predictability. Soil erosion and organic matter decline are measurable and worsening. Biodiversity in agricultural landscapes is declining due to the simultaneous effects of intensification and land abandonment. Water quality concerns (nitrate pollution, pesticide runoff) are present in Pelagonija, Polog, and Southeast irrigated zones. Carbon sequestration potential in well-managed agricultural soils is significant and could be monetised under future WBGA carbon market frameworks.

Table 3. PESTLE Analysis, Rural Development Enabling Environment (Author, 2026).

10. Good Practice Case Studies

10.1 Community Rainwater Harvesting: Kosovo and Albania

Between 2018 and 2023, the UNDP GEF Small Grants Programme supported community RWH initiatives in southern Kosovo (Prizren region) and north-eastern Albania (Has and Kukës districts) in agro-climatic conditions directly comparable to Polog and the Eastern Region. Systems installed at household and community scale using polyethylene tanks of 3,000 to 8,000 litres, with simple gravity-fed drip irrigation connections, achieved documented results that are directly applicable to the Harvesting Hope project context.[52]

[52]UNDP GEF Small Grants Programme, Evaluation Report: Rainwater Harvesting in Kosovo and Albania (Bratislava, 2023), pp. 11–15.

Seventy-eight per cent of participating households reported reduced food expenditure attributable to improved kitchen garden output within the first growing season. Sixty-five per cent of participating households reported that women had assumed primary management responsibility for the RWH system and garden, with observable increases in intra-household decision-making authority. Participating gardens used an estimated 40 to 60 per cent less water than comparable non-participant gardens using traditional flood or sprinkler irrigation. Average system cost was EUR 380 per household, inclusive of installation support, with a reported kitchen garden income increase of EUR 180 to 250 per year, implying a payback period of 18 to 24 months.

10.2 Women-Led Agricultural Cooperatives: Pelagonija

The Agro Women cooperative in Bitola municipality, supported through the EBRD Women in Business programme and GIZ's Green Economy project between 2019 and 2022, has been cited as an example of women-led agricultural marketing in the Macedonian context.[53] Reported outcomes include the aggregation of production from twenty-eight women farmers across twelve villages, development of a collective brand for organic-process vegetables and preserves, and sales through Skopje farmers' markets and a direct supply contract with a regional hotel chain. Average member income from cooperative sales was reported to have increased by EUR 120 to 180 per year within two years, and members reported improved negotiating position regarding agricultural decision-making. The cooperative also created a peer learning network that reduced extension officer dependency and improved technology adoption rates among members.

This case illustrates that women-led cooperative structures in North Macedonia's rural areas can generate both economic and empowerment outcomes, but require sustained institutional support, market linkage facilitation, and bridging finance to reach viability. The Harvesting Hope project can learn from and build upon this model in its community garden group design.

10.3 Rural Tourism Integration: Prespa Apple Trail

The Prespa Apple Trail initiative, developed by Resen municipality with civil society and private sector support, created a branded agritourism product linking apple orchards, Prespa Lake birdwatching, and local gastronomy. Though still nascent, the initiative demonstrated the viability of agriculture-tourism integration in Pelagonija and provides a replicable model for other regions, particularly the wine-and-food integrations possible in the Vardar and Southeast Regions. Key success factors were local government engagement, clear branding, and digital marketing capacity provided by a partnering NGO. The primary constraint identified was the absence of certified rural accommodation to host multi-day visitors, a gap that direct investment in rural hospitality infrastructure under IPARD or domestic rural development funds could address.

11. Stakeholder Mapping

Effective rural development in the five target regions involves a layered ecosystem of public, private, and civil society actors with varying mandates, capacities, and interests. Table 4 maps key stakeholders across these categories with an assessment of their relevance to the Harvesting Hope project objectives.

Stakeholder	Category	Role / Interest	Project Relevance
MAFWE	National public	Policy authority for agriculture, rural development, water; IPARD Paying Agency.	High, policy alignment, potential endorsement of project outputs.
MEPP	National public	Water licensing, environmental permitting, WFD transposition.	Medium, regulatory framework for RWH and environmental

[53] EBRD, Women in Business Programme: Evaluation of North Macedonia Portfolio 2019–2022 (London, 2022).

			compliance.
Planning Region Centres (Polog, Pelagonija, Vardar, Southeast, Eastern)	Regional public	Regional development planning, IPARD coordination, stakeholder convening.	High, direct training audience and regional plan development partners.
Target Municipalities	Local public	Land management, rural roads, community facilities, social services.	High, implementation environment; potential land for community gardens.
Water User Associations	Public/associative	Irrigation management and water allocation at scheme level.	Medium, potential partners for RWH awareness; WUA reform target.
APZRR (Extension Service)	Public	Technical advisory to farmers; IPARD application support.	High, primary channel for technology transfer to project beneficiaries.
Legis and Institute Circle	Civil society	Project implementers; community mobilisation; training delivery; advocacy.	Critical, direct project management and community engagement.
Women's and Roma NGOs	Civil society	Community outreach, beneficiary identification, gender monitoring.	High, essential for inclusion of most marginalised beneficiaries.
Agricultural Cooperatives	Private/associative	Collective input purchasing, production aggregation, market access.	Medium, potential scaling channel for RWH and composting.
LEADER Local Action Groups	Civil/private	Rural tourism and local development; LEADER programme implementation.	Medium, linkage of project gardens with agritourism products.
IFIs (World Bank, EBRD, UNDP, FAO)	International	Technical assistance, co-financing, policy dialogue.	Medium-high, alignment with larger programmes; knowledge exchange.
Commercial Banks	National	Financing, adaptation funding, transition financing	Medium-high; access to finance longer term.

Table 4. Stakeholder Mapping, Harvesting Hope Project (Author, 2026).

12. Recommendations

12. 1. Recommendations for Training on Sustainable Rural Development for Local Experts and Decision-Makers

The study provides the basis for recommending a set of trainings on sustainable rural development that will be delivered under the Harvesting Hope project to local experts and decision-makers (regional authorities, municipal officials, Planning Region Development Centres, Water User Associations, and agricultural extension services – APZRR). The training can focus on climate-smart agriculture, sustainable resource management, tourism, and the role of women and other marginalized groups in rural development, while promoting collaboration among regional authorities and providing practical guidelines for the preparation of regional sustainable rural development plans.

The following specific training programme consists of seven targeted one-day trainings. **Five trainings are designed for local experts and decision-makers, while two trainings target community-level beneficiaries. Each training is designed as an intensive, participatory one-day workshop (8 hours, including breaks and practical exercises) that ensures gender sensitivity, multilingual delivery, and at least 50 % female participation where applicable.**

Training 1: Climate-Smart Agriculture and Sustainable Resource Management

Target participants: APZRR extension officers, municipal agricultural officers, and WUA representatives from the five regions.

Objectives: Equip participants with practical tools to integrate rainwater harvesting (RWH), composting, and soil health measures into local extension services and municipal planning, directly responding to the documented irrigation infrastructure deficit, declining soil organic matter, and increasing drought frequency.

Core content:

- Rapid region-specific water stress mapping and climate-smart solutions tailored to each region (Polog seasonal drought, Pelagonija irrigation underutilisation, Vardar/Southeast peak-summer deficits, Eastern rain-fed dependence).
- Design, costing, and simple maintenance of household/community 5,000-litre RWH systems with gravity-fed drip irrigation (proven water savings from comparable experiences).
- Composting protocols using on-farm waste and manure to restore soil organic matter and reduce synthetic inputs.
- Immediate integration steps into extension curricula and municipal plans.

Practical output: Each participant completes a one-page municipal scaling checklist for RWH and composting, including priority beneficiary targeting (women-headed and resource-poor households) and basic cost estimates.

Training 2: Rural Tourism Development and Agricultural Income Diversification (Ana Labor)

Target participants: Municipal tourism officers, LEADER Local Action Groups, Planning Region Centres, and representatives of agricultural cooperatives. Duration: 1 day. Objectives: Enable participants to link local agricultural production with under-developed rural tourism assets, addressing the structural barriers.

Core content:

- Region-specific tourism asset mapping and quick-win product development: Mavrovo/Šar Planina (Polog), Prespa Apple Trail (Pelagonija), Tikveš wine route (Vardar), Lake Dojran/Strumica Carnival (Southeast), Maleshevo/Bregalnica wine route (Eastern).
- Practical farm-to-table integration models using project community gardens as supply sources, joint branding, and basic digital marketing.
- Overcoming key barriers through IPARD and national tourism instruments.

Practical output: Participants draft a one-page regional agritourism pilot concept that incorporates produce from women-led community gardens and sets measurable income-diversification targets.

Training 3: Gender Equality and Social Inclusion in Rural Development (Sashka Petrova)

Target participants: Municipal gender focal points, cooperative leaders, and Planning Region Centre staff.

Objectives: Address the documented structural exclusion of women and marginalised groups (Roma, Albanian-speaking communities, elderly farmers, female-headed households).

Core content:

- Legal and practical steps for joint land titling and recognition of women's labour in cadastral records.
- Mandatory 30 % female membership and board representation in WUAs and cooperatives.
- Design of women-only outreach for IPARD, extension services, and VSLA-style savings groups linked to community gardens.
- Intersectional approaches for Roma women, elderly single women, and linguistic minorities.

Practical output: Participants develop a one-page gender-action checklist and beneficiary-selection criteria for regional rural development measures, plus a template for gender-responsive budgeting.

Training 4: Collaborative Preparation of Regional Sustainable Rural Development Investment Plans

Target participants: Planning Region Development Centres, municipal decision-makers, and key stakeholders from all five regions (joint sessions on how to apply what they learn in their planning).

Objectives: Provide direct guidelines and templates for preparing regional sustainable rural development plans aligned with national strategies, EU pre-accession requirements, UN SDGs, the Western Balkans Green Agenda, and the EU Growth Plan Reform Agenda.

Core content:

- Rapid application of the study's SWOT and PESTLE analyses at regional level.
- Integration of community RWH, composting, and women-led garden networks as core implementation modalities.
- Use of stakeholder mapping to build multi-actor partnerships.
- Results-based monitoring and documentation for EU accession, VNR, and green-lending evidence.

Practical output: Participants co-produce the first draft of a Regional Sustainable Rural Development Plan Template (with mandatory gender, climate adaptation/RWH-composting, and tourism-agriculture chapters) ready for immediate use.

Training 5: Gender-Responsive Rural Finance and Green Lending for Women Smallholders

Target participants: Municipal economic development/finance officers, Planning Region Centre staff, APZRR extension officers, local bank representatives, and leaders of women's cooperatives and NGOs.

Objectives: Enable participants to address the structural financial exclusion of rural women and position women-led RWH, composting, and community garden initiatives within the National Bank's emerging climate risk and green lending framework.

Core content:

- Key barriers to rural finance for women and their regional impacts.
- Practical solutions: joint land titling, women-only IPARD outreach, VSLA groups linked to community gardens.
- Opportunities in NBRNM climate-risk guidelines and draft green lending framework – using project outcomes (water savings, soil organic matter gains, yield stability) as bankable evidence.

- Simple documentation protocols for blended and concessional finance.

Practical output: Participants complete (a) a one-page regional gender-responsive finance outreach plan and (b) basic templates for collecting climate-performance data from women beneficiaries for green-lending applications.

Training 6: Hands-on Training for Beneficiary Households on Rainwater Harvesting, Composting and Kitchen Gardening

Target participants: Members of beneficiary households and community garden groups (with strong priority given to women and female-headed households) across the five regions.

Objectives: Provide direct, practical skills to project beneficiary households so they can effectively install, operate, and maintain rainwater harvesting systems, composting units, and productive kitchen/community gardens, thereby improving household water security, soil health, and food production.

Core content:

- Step-by-step installation, maintenance, and optimal use household/community RWH systems with gravity-fed drip irrigation.
- Practical composting techniques using household, kitchen, and farm organic waste to improve soil fertility.
- Climate-smart and water-efficient kitchen gardening methods, including crop selection, mulching, and integrated pest management suited to each region's conditions.
- Women's central role in managing these systems and strategies for collective maintenance through community garden groups.

Practical output: Participants receive hands-on training by assembling a small-scale demonstration system, develop personalized maintenance schedules, and form or strengthen community support networks for ongoing peer assistance and knowledge sharing.

Training 7: Rural Women's Entrepreneurship and Business Development

Target participants: Rural women participating in community garden groups, women-led cooperatives, and aspiring women entrepreneurs from the five regions. Duration: 1 day.

Objectives: Strengthen the economic agency of rural women by equipping them with practical business skills to transform garden produce, RWH-enabled surplus, and traditional knowledge into viable income-generating activities.

Core content:

- Fundamentals of small-scale rural business planning, product development (e.g., preserves, pickles, dried herbs, value-added garden products), and basic financial management.
- Market identification, branding, packaging, and low-cost marketing strategies, including linkages with rural tourism and local markets.
- Access to finance options (VSLA, IPARD, green lending) and business formalization processes tailored for women.
- Successful models of women-led agribusiness from the region and collective enterprise approaches.

Practical output: Each participant develops a simple one-page business idea canvas for a garden-based micro-enterprise and identifies next steps for implementation and peer support networks.

Cross-cutting delivery requirements for all trainings

- Intensive participatory methodology with short field or demonstration visits (where logistically feasible) to Harvesting Hope sites and good-practice examples.
- Multilingual, gender-balanced format with explicit inclusion of marginalised groups.
- Provision of all materials in open digital format for immediate use by regional authorities and communities.
- Built-in peer-learning segments to foster collaboration across the five regions.
- Optional half-day follow-up mentoring sessions (per region or community) scheduled 4–6 weeks after each training to support implementation of the practical outputs.

The trainings can serve as the operational bridge between the project's community-level interventions and the institutional changes needed for inclusive, climate-resilient rural development in the target regions. They would also generate immediate deliverables (checklists, templates, pilot concepts, and skilled beneficiary groups) that feed into the post-training meetings of regional representatives foreseen in the project design. Certainly, the number of trainings, which trainings and how many times these are implemented and in which region is also contingent on the project planning, timeline and budget.

12.2 General Recommendations

The following thirteen recommendations are structured around four strategic pillars and are addressed to specific institutional actors. They are sequenced by feasibility: short-term actions achievable within the project period (2026); medium-term actions for 2027 to 2028; and longer-term systemic reforms for 2029 and beyond. Where relevant, they are cross-referenced with the EU pre-accession obligations and UN SDG targets identified in Chapter 8.

Pillar I: Integrated Water and Land Governance

Recommendation 1, Complete WFD Transposition with a Rural Water Security Lens (Addressed to: MEPP, MAFWE, Planning Region Centres, Medium-term).

MEPP and MAFWE should jointly develop a roadmap for completing EU Water Framework Directive transposition that explicitly addresses agricultural smallholder water security. The roadmap should include a Rural Water Security Module identifying low-cost, community-based water solutions, including rainwater harvesting, as complementary instruments alongside formal irrigation infrastructure rehabilitation. Completion of WFD transposition by 2027 aligns directly with EC accession benchmarks and is achievable within the existing legislative reform timetable.

Recommendation 2, Reform Water User Associations with a Gender Inclusion Mandate (Addressed to: MAFWE, Ministry of Labour and Social Policy, Short-to-medium-term)

The Water Law should be amended to require a minimum 30 per cent female membership and at least one female board member in all registered Water User Associations. MAFWE should provide targeted capacity building to operationalise this requirement, including women-specific outreach and simplified

membership procedures. This reform directly addresses a structural exclusion documented across all five target regions and aligns with SDG 5 and CEDAW obligations.

Recommendation 3, Establish Household RWH as a Recognised Rural Development Measure (Addressed to: MAFWE, Paying Agency, Project Partners, Short-to-medium-term)

MAFWE should include household and community-scale RWH systems as eligible investments under the national rural development support programme and future IPARD programming. A simplified grant scheme (maximum EUR 1,000 per household, co-financing 80:20 in favour of the beneficiary) specifically targeting women-headed households and households below the poverty threshold should be designed and piloted in the five target regions, using the Harvesting Hope project as an evidence base.

Pillar II: Inclusive Agricultural Productivity Enhancement

Recommendation 4, Integrate Composting and Soil Health into Extension Curriculum (Addressed to: APZRR, Legis/Institute Circle, MAFWE, Short-term, immediate implementation)

The national agricultural extension service should integrate composting, soil organic matter management, and water-efficient irrigation as core content in its advisory curriculum for smallholders in the five target regions. A minimum of one demonstration composting site per municipality in the project area should be established, co-located with community gardens and managed through a Farmer Field School model ensuring at least 50 per cent female participation.

Recommendation 5, Design Gender-Responsive IPARD Outreach (Addressed to: MAFWE, Paying Agency, UN Women, CSO partners, Medium-term)

The IPARD Paying Agency and MAFWE communication teams should develop a targeted outreach campaign specifically addressing women smallholders across the five regions, including multilingual application guidance in Macedonian, Albanian, Turkish, and Romani; women-only information sessions in community settings; simplification of collateral requirements through a state guarantee fund mechanism; and a women's IPARD quota of a minimum 30 per cent of supported beneficiaries in measures relevant to smallholders.

Recommendation 6, Create a Policy Circular Linking Organic Waste, Composting, and Soil Health (Addressed to: MEPP, MAFWE, Municipalities, Project Partners, Medium-term.)

A cross-sectoral policy instrument integrating the competencies of MEPP (waste law), MAFWE (agricultural inputs), and municipalities (waste collection) should be developed to link municipal organic waste management with agricultural composting and soil health objectives. The Harvesting Hope project's community composting component should be documented as a replicable model and presented to relevant ministries as a design reference.

Pillar III: Gender-Transformative Rural Development

Recommendation 7, Strengthen Joint Land Titling (Addressed to: AREC, Ministry of Justice, UN Women, CSO partners, Medium-term.)

AREC should launch a targeted campaign promoting voluntary joint land titling in rural areas of the five target regions, supported by legal aid for women seeking to regularise land ownership, community information sessions in partnership with women's NGOs, and an AREC target of 10,000 new joint title registrations in rural areas by 2028. Joint land titling has demonstrated impacts on women's investment in land improvement, agricultural technology adoption, and access to formal credit in comparable contexts.

Recommendation 8, Establish Women-Led Community Garden Networks as Core Implementation Modality (Addressed to: Legis, Institute Circle, selected municipalities, Short-term, immediate implementation.)

The Harvesting Hope project should establish community garden groups with a minimum 70 per cent female membership as its primary implementation structure. Each group should incorporate a governance function with elected leadership, a savings function linked to formal VSLA models, and a peer knowledge-sharing function. A regional network connecting groups across the five regions for joint market access and policy advocacy should be resourced within the project framework.

Recommendation 9, Build Gender-Disaggregated Rural Development Monitoring Capacity (Addressed to: Planning Region Centres, SSO, Project Partners, UN Women, Short-term)

Planning Region Centres and project-area municipalities should be supported to develop gender-disaggregated baselines and monitoring indicators for agricultural and rural development plans, covering at minimum: land ownership by gender; cooperative membership by gender; access to extension services by gender; and climate adaptation technology adoption by gender. The Harvesting Hope project should contribute to this baseline through its own M&E system and share data with regional authorities.

Pillar IV: EU Accession and UN SDG Alignment (Addressed to: Project Partners, Planning Region Centres, MAFWE, Short-term, within project period)

Recommendation 10, Co-Produce a Regional Sustainable Rural Development Plan Template

The project's training programme should culminate in the co-production of a Regional Sustainable Rural Development Plan template aligned with NARDS 2021–2027, EU CAP pre-accession requirements, and SDG 2, 5, 6, 13, and 15 targets. The template should include a mandatory gender and social inclusion chapter, a climate adaptation measures section, and a community water management annex that situates RWH systems within a broader water governance narrative accessible to non-specialist decision-makers.

Recommendation 11, Systematically Document Project Outcomes as EU and SDG Evidence (Addressed to: Legis, Institute Circle, Government of Slovenia mission in Skopje, Medium-term)

The Harvesting Hope project should develop a documentation and advocacy strategy that translates community-level outcomes into evidence relevant for North Macedonia's EU accession process and VNR reporting. This includes quantifying water savings achieved through RWH systems, calculating composting impact on soil organic matter, documenting changes in women's decision-making authority, and presenting findings in formats accessible to MAFWE, MEPP, and the EU Delegation in Skopje.

Recommendation 12, Leverage Rural Tourism Linkages for Agricultural Income Diversification (Addressed to: Project Partners, Rural Tourism Associations, LEADER LAGs, Medium-term)

The project should integrate rural tourism connections into its community garden and composting components by identifying at least one rural tourism enterprise in each region willing to source from project community gardens, developing a joint branding concept linking garden produce with local cuisine and hospitality (with particular attention to the wine–food integration potential of the Vardar and Southeast Regions), and incorporating rural tourism marketing content into the training programme for regional decision-makers. This creates a scalable income diversification pathway beyond subsistence agriculture that is particularly accessible to women-led households.

Recommendation 13, Position Project Outcomes within the Emerging Climate Finance Architecture (Addressed to: NBRNM, Project Partners, MAFWE, EBRD, World Bank, UNDP, Medium-to-long-term)

Project partners should engage proactively with the National Bank of the Republic of North Macedonia (NBRNM) consultation process on the draft Guidelines on Green Lending and design the project's monitoring and evaluation framework to generate data compatible with emerging green-lending eligibility criteria. Specifically, the M&E system should record baseline and endline measurements of household water use per cropped area, soil organic matter content, crop yield stability across rainfall-variable years, and household food expenditure, in formats that can be aggregated into community-level climate resilience profiles attached to women's names regardless of formal land title. The project should also work with the European Bank for Reconstruction and Development, the World Bank, and UNDP to position the documented outcomes as a proof-of-concept for a gender-lens green-lending pilot under the NBRNM's preferential reserve and refinancing windows, with a view to crowding in commercial bank co-financing under blended finance arrangements. This recommendation directly addresses the financial-sector integration described in section 8.5 and converts a tightening climate-risk constraint into an enabling instrument for pro-poor rural finance.

13. Conclusions

This study has documented a convergent set of challenges across the Polog, Pelagonija, Vardar, Southeast, and Eastern Regions of North Macedonia: declining soil health, degraded water infrastructure, climate stress, land tenure insecurity, and gender-based exclusion are simultaneously constraining the agricultural livelihoods of the most vulnerable rural households. These challenges are not isolated but they are structurally interconnected and mutually reinforcing, and they are deepening in the context of accelerating climate change and rural demographic decline.

The five regions are at the same time strikingly diverse. Polog's protected horticulture and Albanian-speaking community context, Pelagonija's flat-land cereal and apple economy, the Vardar Region's wine-anchored mid-valley economy with the country's lowest population density, the Southeast Region's intensive vegetable export complex with its acute water and pesticide pressures, and the Eastern Region's rain-deficient mixed farming with its concentrated rural poverty all require differentiated programmatic responses, even within a coherent national framework.

Against this challenging backdrop, the Harvesting Hope project is well-conceived, appropriately targeted, and timely. Community rainwater harvesting, composting, and kitchen gardening are not marginal interventions: they are evidence-based, low-barrier, high-impact pathways to improved food security, reduced water vulnerability, enhanced soil health, and women's economic agency that are directly accessible to the most resource-constrained households. When delivered through women-led community structures with integrated savings and knowledge-sharing functions, these technologies can catalyse transformative change at household and community scale.

The study also finds that North Macedonia's EU accession obligations and UN SDG commitments create a broadly supportive policy environment, but that the translation from normative commitment to operational implementation is consistently incomplete. The project has a strategic opportunity to serve as a proof-of-concept for community-scale climate adaptation and gender-transformative agriculture, generating evidence that can directly inform IPARD programme design, regional development planning, and national policy dialogue on rural water governance.

An additional and increasingly material finding concerns the financial-sector dimension of climate adaptation. The integration of climate-related financial risk into the supervisory framework of the

National Bank of the Republic of North Macedonia, together with the draft Guidelines on Green Lending now in public consultation, represents a structural shift in the conditions under which rural finance will be made available over the coming years. Without targeted pro-poor and gender-responsive safeguards, the new framework risks deepening the existing exclusion of women smallholders and resource-poor households from formal credit. Properly designed, however, it offers a pathway through which the documented water savings, soil carbon gains, and yield-stability outcomes generated by the Harvesting Hope project become bankable evidence of climate resilience, opening access to performance-based green lending instruments, blended-finance facilities, and gender-lens investment vehicles at a scale far beyond what donor grant capital alone can reach. The project's strategic value, accordingly, is not only as a delivery mechanism but as a generator of standardised, replicable evidence that can inform the detailed design of the country's emerging climate finance architecture.

Realising this potential requires deliberate investment in documentation, institutional linkages, and advocacy alongside direct community delivery. The thirteen recommendations advanced in this study provide a structured framework for this dual-track strategy, connecting immediate project actions with medium- and long-term systemic change objectives across all four pillars.

The rural women of Polog, Pelagonija, Vardar, the Southeast, and the Eastern Region, who grow the food, carry the water, manage the gardens, and sustain the communities that national statistics render largely invisible, deserve both immediate practical support and structural change, which the Harvesting Hope project can deliver the former, and, with strategic intent, contribute meaningfully to the latter.

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Annex: EU and UN Compliance Scorecard

The scorecard below summarises the assessed degree of alignment of North Macedonia's rural sector with selected EU pre-accession and UN frameworks, alongside an indication of priority action areas, including those where the Harvesting Hope project can contribute community-level evidence to support broader policy progress.

Framework	Domain	Status	Priority Action
EU CAP	IPARD III absorption	Partial	Increase outreach; simplify applications; women's quota.
EU WFD	River Basin Plans, water pricing	Incomplete	Complete transposition; integrate community water solutions.
EU Farm to Fork	Organic farming target (25% by 2030)	Off-track	Investment in certification, farmer training, market linkage.
EU Gender Equality Strategy	Rural women's economic empowerment	Weak	Joint titling; women-only IPARD; cooperative reform.
WBGA	Climate-resilient agriculture	Nascent	Operational climate adaptation programme; carbon farming.
UN SDG 2	Food security	Off-track	Scale RWH and composting for food-insecure households.
UN SDG 5	Gender equality in agriculture	Off-track	Integrated gender-transformative measures package.
UN SDG 6	Sustainable water management	Partial	WUA reform; community RWH scaling; WFD acceleration.
UN SDG 13	Climate adaptation in agriculture	Weak	Farm-level adaptation plans; agri-environment-climate measure.
UN SDG 15	Soil health, biodiversity	Off-track	Composting and organic conversion at scale.

Compliance Scorecard, North Macedonia Rural Sector versus EU and UN Frameworks (Author, 2026).

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