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THE LONG-TERM IMPACT OF LIVELIHOOD PROJECTS ON LIVING STANDARDS, CLIMATE RESILIENCE, AND COMMUNITY DEVELOPMENT: A CASE STUDY OF LIVELIHOOD PROJECTS IN BOSNIA AND HERZEGOVINA

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Abstract

The research examines the enduring effects of livelihood projects on standard of living and climate adaptation together with community growth in rural Bosnia and Herzegovina. The research examines three agricultural projects from the Muslim Aid Association using the Sustainable Livelihoods Framework (SLF) to evaluate greenhouse vegetable production and cattle rearing and beekeeping. Survey data from the 431 beneficiary households across 62 municipalities enabled the researchers to apply quantitative methods viz. ordinal logistic regression and ANOVA and Spearman's correlation, to analyse income generation and food security and ecological practice adoption, and social cohesion outcomes. The interventions produced substantial positive effects on household income and food availability together with psychological well-being, since 80% of beneficiaries experienced income growth and 95% reached food security. The adoption of climate-smart practices reached its highest level among the greenhouse beneficiaries, but livestock projects produced the most significant positive effects on the community cooperation. The research demonstrates that increased income leads to higher savings rates and business expansion. The research demonstrates that

well-designed livelihood projects can create economic opportunities while strengthening resilience and promoting rural development inclusively, despite the challenges of institutional fragmentation and limited market access. The research presents policy recommendations that focus on integrated training and gender-sensitive programming and post-project support and institutional reform to achieve sustainable and scalable future interventions.

Keywords: Livelihood projects, Rural development, Climate resilience, Food security, Community empowerment, Sustainable agriculture

INTRODUCTION

Bosnia and Herzegovina ranks as one of Europe's most rural countries because 60% of its population resides in rural areas. The main economic force behind rural areas in these regions is agriculture. The population of this country faces vulnerable conditions at a rate of 50% while social exclusion affects half of the total population. The municipalities and rural communities of Bosnia and Herzegovina with limited employment opportunities depend on livelihood projects to provide stable income to vulnerable groups, including people with lower education levels and women and low-income families and persons with disabilities and rural residents. The livelihood projects deliver resources and training to these categories through agricultural initiatives and small business development programs. These initiatives work to achieve social inclusion while reducing poverty and developing communities (World Bank , 2023).

The agricultural budget of Bosnia and Herzegovina faces funding challenges because it lacks sufficient support despite its economic value. The agricultural sector employs about 20% of the population while providing essential income to rural communities yet public funding does not reflect its strategic value. The agricultural budget shows inconsistent patterns across different entities because it mainly provides direct subsidies instead of investing in sustainable development initiatives like infrastructure development and innovation and rural diversification. The current funding distribution pattern hinders the agricultural sector from achieving better competitiveness and resilience. The budget allocations need restructuring to achieve sustainable impact through the investments that enhance productivity and meet the EU Common Agricultural Policy (CAP) standards. The country can use pre-accession funds to maximize public spending returns in rural development through this approach (Jahić & Prodanović, 2018). In addition to livelihood projects, Bosnia and Herzegovina has a long history of agricultural credit interventions, particularly through the International Fund for Agricultural Development (IFAD). Since 1996, IFAD has implemented multiple projects that

introduced various lending modalities—from in-kind livestock distribution to structured credit lines through the banks and microcredit organizations. These efforts aimed to rebuild rural economies post-conflict and expand access to finance for smallholder farmers and rural entrepreneurs. (Vaško, Omanović, Figurek, & Kosić, 2011).

The World Bank and International Monetary Fund classify Bosnia and Herzegovina as an upper-middle-income developing country, yet the nation faces ongoing political and economic instabilities. The political and economic instabilities have resulted in Bosnia and Herzegovina maintaining underserved municipalities and rural communities, while people face food insecurity and unstable income and limited sustainable ways to earn money. The research (Žurovec & Vedeld, Rural livelihoods and climate change adaptation in laggard transitional economies: A case from Bosnia and Herzegovina. Sustainability, 2019) shows that climate change makes these problems worse by causing lower harvests and worse product quality, and more unpredictable farming, which directly affects food security and the economic survival of rural households.

Development economics has thoroughly studied the connection between sectoral productivity and poverty reduction. The research by (Erumban, 2024) demonstrates that productivity growth in the agricultural and manufacturing sectors leads to poverty reduction when these sectors employ numerous poor people.

The National Rural Livelihoods Project (NRLP) in India conducted a large-scale intervention from 2012 to 2019, which resulted in substantial growth of household income by 19% and savings by 28% and social scheme access by 6.5% for rural poor populations. The findings demonstrate that properly designed livelihood programs can create substantial change in rural areas with structural disadvantages (Kochar, 2020).

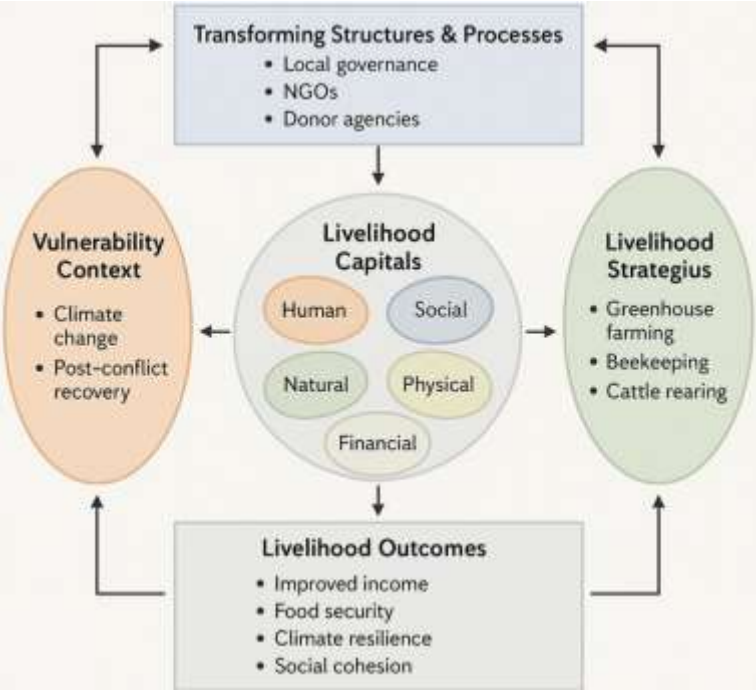
Lopez-Avila states that agriculture provides the main source of income for 70% of the global rural population; however, smallholder farmers in low- and middle-income countries (LMICs) continue to encounter ongoing obstacles to innovation adoption. The main obstacles for smallholder farmers in L&MICs include restricted access to credit facilities and infrastructure and knowledge dissemination systems. Agricultural innovation functions as both a productivity tool and a means to build resilience and reduce poverty while promoting inclusive development. (Lopez-Avila, 2017). (Bergougui, 2023) also confirmed that institutional quality is a key factor in determining how well a country can convert resource-based interventions into sustainable outcomes. Their findings suggest that without adequate institutional support, natural resource-based projects may fail to deliver long-term benefits. (Esteves, 2024) examined how international standards and social impact assessment (SIA) practices handle livelihood impacts in development projects. The authors emphasize that development projects need extended

support together with participatory planning and must consider both material and immaterial losses which affect vulnerable groups.

The research titled "The Long-Term Impact of Livelihood Projects on Living Standards, Climate Resilience, and Community Development: A Case Study of Livelihood Projects in Bosnia and Herzegovina" investigates how three Muslim Aid Association livelihoods projects affect living standards and climate resilience and community development in Bosnia and Herzegovina. The Greenhouse project which is also known as the “Economic empowerment of socially and materially vulnerable persons and young persons throughout greenhouse production” started its implementation in 2016. The project has benefited more than 3000 people and has provided 100 m2 greenhouses with irrigation systems, seedlings, and training for beneficiaries. Cattle-rearing projects so far had 298 beneficiaries and the beekeeping project had 98 beneficiaries. The beekeeping projects' direct beneficiaries received training and beehives and processing equipment while the associations of beekeepers obtained reproduction and processing equipment that benefits both association members and the broader community.

The research employs the Sustainable Livelihoods Framework (SLF) to examine projects in Bosnia and Herzegovina, focusing on their impacts on living standards, climate change resilience, and community development. The following visual representation illustrates the framework.

Figure 1: Sustainable livelihood framework



The Sustainable Livelihoods Framework has been adapted for Bosnia and Herzegovina in the following figure. The framework incorporates post-conflict recovery, climate vulnerability, and institutional fragmentation, while emphasising livelihood strategies such as greenhouse farming, beekeeping, and cattle rearing. The research was driven by the scarcity of empirical data regarding livelihood interventions' effects on living standards and community resilience in Bosnia and Herzegovina. The research targets vulnerable populations to generate practical findings which will improve the effectiveness and sustainability of development programs in the region. This empirical data gap is reflective of the wider climate vulnerability literature (Žurovec, Vedeld, & Sitaula, 2015) highlight that national-level plans are in place but highly detailed local-level vulnerability studies are lacking in Bosnia and Herzegovina. Their work illustrates how spatially disaggregated vulnerability mapping is needed to provide adaptation measures that can be suited to the particular requirements of rural municipalities.

The Strategic Plan for Rural Development of BIH (2018–2021) and its local adaptations emphasise the importance of sustainable agriculture, infrastructure development, and inclusive governance in rural areas. These frameworks provide a policy backdrop for evaluating the long-term impact of livelihood projects. (The Ministry of Foreign Trade and Economic Relations (MoFTER), 2018). The design of effective livelihood interventions requires understanding how power and knowledge relate to each other within communities. The (Institute of Development Studies, 2022) study shows that participatory development models become truly inclusive only when they challenge the dominant discourses and enable the marginalised voices to shape development trajectories effectively.

Rural development in Bosnia and Herzegovina needs more than policy alignment because it requires institutional capacity and market integration, and climate resilience. Rural areas need strategic investments in digital governance and food safety systems, and climate-smart agriculture to enhance the competitiveness and reduce vulnerability. The Agriculture Resilience and Competitiveness Project (ARCP) implements these priorities through traceability systems and irrigation infrastructure and public-private partnerships to support EU alignment. Integrated development models achieve market access improvement and import dependency reduction and long-term agri-food sector resilience through institutional reform combined with producer-specific support (World Bank, 2022).

The increasing institutional dedication to sustainable development has led Bosnia and Herzegovina to establish a national framework which implements the Sustainable Development Goals (SDGs) through strategic planning across all government levels. The framework, which state and entity and district authorities have endorsed, integrates development priorities into budgetary processes while prioritising inclusive governance and digital transformation and

resilience-building as fundamental elements of sustainable rural development. (UNDP, 2023). The Republic of Srpska's rural development strategy (2021–2027) focuses on moving away from direct subsidies and instead invests in structural elements like infrastructure, cooperative development and market access in this Bosnian Herzegovinian entity. This approach is in line with global best practices in building long-term resilience among rural populations (Ministry of Agriculture, Forestry and Water Management of the Republic of Srpska, 2021)

(Association Network for Building Peace, 2023) conducted a complementary participatory study which identified socio-economic development needs of 35 local communities in BIH through the analysis of poverty and gender inequality and weak institutional support. The research results confirm the need to assess livelihood projects in vulnerable rural areas. To better understand the theoretical and empirical foundations of livelihood interventions, the following literature review synthesizes global and regional evidence.

RESEARCH METHODOLOGY

The Muslim Aid Association assessed their livelihood projects, which serve as the source of secondary data for this research. The Association for Research and Social Innovation "Analysis, Design, Transformation" (ADT) performed the assessment. The research evaluates the effectiveness and sustainability of interventions, together with their relevance to their planned impacts. The analysis depends exclusively on organisational records because no new primary data collection will occur.

The research design uses quantitative methods through a cross-sectional study, which includes 431 beneficiary households distributed across 62 municipalities in Bosnia and Herzegovina. The survey included households that participated in livelihood activities, which included greenhouse vegetable cultivation and cattle farming and beekeeping operations. The main goal focuses on evaluating how these interventions affect food security and income generation and climate resilience, and community development, particularly for vulnerable groups, including unemployed individuals and people with disabilities and women and rural residents.

(Bergougui, 2023) employed a similar quantitative method through IV-GMM estimation and multiple imputation to evaluate the long-term impacts of natural resource dependence. The authors used resource type disaggregation and institutional quality interaction testing, which provides a useful reference point to assess the wider applicability of the results of the current study.

A comparable quantitative approach was used by Bergougui and Murshed (2023), who applied IV-GMM estimation and multiple imputation to assess the long-term effects of natural

resource dependence. Their methodology included disaggregating resource types and testing interaction effects with institutional quality, offering a useful benchmark for evaluating the broader relevance of the findings of this study.

The survey data offers detailed insights about project effects across different community environments because it includes a wide range of households from diverse geographic and socio-economic backgrounds. The baseline data collection used stratified sampling to ensure proper representation. The method follows best practices which (Žurovec, Vedeld, & Sitaula, 2015) recommend through their use of localised socio-economic and biophysical indicators to measure rural vulnerability heterogeneity. The research demonstrates that Bosnia and Herzegovina's small size does not prevent significant municipal-level vulnerability differences from existing.

Spatial variation in vulnerability is also reflected in exposure to climate change. As (Žurovec, Čadro, & Sitaula, 2017) demonstrate, the north is more exposed to floods and droughts, while the south is increasingly affected by decreasing precipitation and increasing temperatures. It is such spatial patterns that must inform the development of future livelihood programs in order for climate-smart targeting to be assured.

The research questions and data structure, and statistical methods were aligned through the development of the following hypotheses, which were tested using appropriate quantitative methods:

H_1: The implementation of livelihood projects results in quantifiable improvements of household income stability.

The research applied Spearman's Rank-Order Correlation and the Chi-Square Test for Independence to investigate the relationship between pre-project financial status and reported income increase.

H_2: The type of assistance received significantly influences the likelihood of adopting ecological practices.

The research employed Ordinal Logistic Regression to assess this hypothesis through an analysis of gender, age and assistance type as predictors of ecological practice adoption frequency.

H_3: Improved food security is associated with reduced household stress and anxiety.

The research applied Spearman's Rank-Order Correlation to assess the relationship between perceived nutritional quality and dietary diversity improvements and psychological stress reductions.

H_4: Beneficiaries who report higher income growth are more likely to reinvest or save.

The research used Ordinal Logistic Regression to test this hypothesis by analysing income growth as the predictor variable and reinvestment/savings behaviour as the outcome variable.

H_5: Participation in the project is associated with improved community relationships and social cohesion.

The research questions and data structure, and statistical methods were aligned through the development of the following hypotheses, which were tested using appropriate quantitative methods.

The research used One-Way ANOVA and Tukey's HSD post-hoc test to determine whether the type of assistance received had a significant impact on the level of improved cooperation with social actors, as measured through a composite Cooperation Index.

The evaluation framework for livelihood projects draws its information from strategic rural development indicators, which appear in local plans, including Livno's 2019–2024 strategy and the HNK 2021–2027 plan to measure employment and infrastructure development and environmental sustainability outcomes.

The ERRY programme in Yemen used a stratified sampling method to evaluate the micro-business support intervention by comparing treatment and control groups. The research design used both quantitative and qualitative methods, which included structured surveys and key informant interviews and focus group discussions. The mixed-methods research design allowed researchers to understand both economic and social effects, as well as the unanticipated positive outcomes that included enhanced social cohesion and women's empowerment (UNDP, 2019).

In this study, qualitative information was analysed through the use of both descriptive and inferential statistical methods to examine the research hypotheses systematically. Descriptive statistics (means, medians, standard deviations, frequencies, percentages) was utilised to report beneficiaries' socio-economic profile, income change, food security levels, adoption of climate-smart practices, and community participation rates. Inferential statistics included:

- Spearman's rank-order correlation to assess monotonic relationships between ordinal variables (e.g., income change and stress reduction).
- Chi-square tests to examine associations between categorical variables (e.g., income sufficiency and income growth).

- Ordinal logistic regression to model predictors of ordered outcomes (e.g., ecological practice adoption, reinvestment behaviour).

These methods were selected based on the ordinal nature of the survey data and the non-parametric distribution of key variables.

The strategic framework of the Federation of B&H emphasises the need to shift towards environmentally sustainable agricultural models which prioritise organic production and biodiversity conservation, and climate variability resilience. (Federal Ministry of Agriculture, Water Management and Forestry, 2021).

The dataset underwent initial preparation and organization in Microsoft Excel before serving as the main tool for data cleaning and structuring. The research design and hypothesis testing framework of this study used SPSS to execute descriptive statistics and chi-square tests and Spearman's rank-order correlations and ordinal logistic regression.

The (Fata & Tomori, 2022) highlight how IoT and blockchain and AI and the big data analytics work together to support circular economy transitions. Real-time data collection through these technologies allows for better monitoring and evaluation of livelihood projects by tracking income and food security and ecological practices in various geographic areas.

The IPA II framework requires the creation of complete monitoring and evaluation systems to assess the effectiveness of rural development policies. These systems exist to help policymakers make decisions based on the evidence while maintaining accountability throughout all implementation levels (European Commission, 2018).

Future assessments of livelihood projects in BiH should use Return on Investment (ROI) or Social Return on Investment (SROI) frameworks in addition to statistical significance testing. The UN's financial modeling for social protection in BiH shows that such tools can be used to maximize resource allocation. These models enable the economic evaluation of livelihood interventions by measuring the relationship between implementation costs and the achieved income gains and resilience outcomes (UN, 2024).

Economic modeling frameworks including cost-benefit analysis and ROI estimation should be used together with statistical analysis to evaluate the feasibility of livelihood interventions. The World Bank's ARCP in BiH shows this approach through its irrigation subprojects which achieved an Economic Rate of Return (ERR) of 32% and a benefit-cost ratio of 5.3. The ERR of 19% from matching grants proved that blended financing in agriculture has a solid economic basis. (World Bank, 2022). Unfortunately, due to limitations in data availability and the scope of this study, such economic modeling frameworks were not applied within the primary research based on surveys. Instead, the study focused on capturing perceived long-term impacts using descriptive and inferential statistical methods. The READ SI

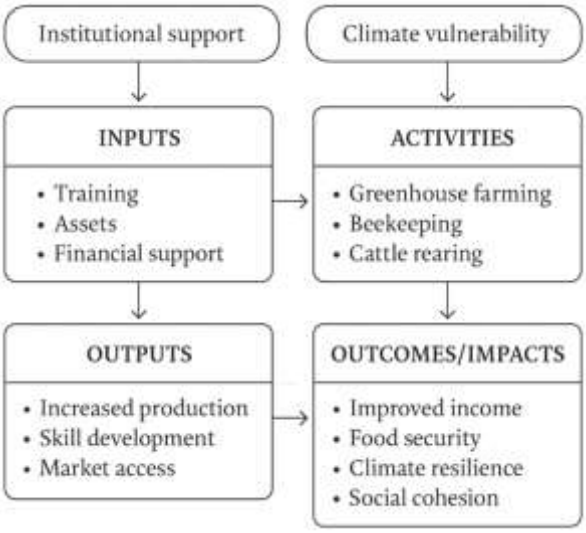
programme in Indonesia showed that integrated livelihood interventions can generate strong economic returns. The programme reported an Economic Internal Rate of Return (EIRR) of 19% and a benefit-cost ratio of 1.5–3.2 across various models (e.g., cocoa, rice, goats). These results support the use of ROI and cost-benefit frameworks in assessing livelihood projects, particularly when evaluating long-term sustainability and value-for-money in rural development (IFAD, 2017).

The FAO guide emphasises the necessity of stratified sampling and power calculations to achieve representativeness and statistical validity in agricultural impact evaluations. The research design follows best practices by using stratified sampling to achieve balanced representation between intervention types and geographic areas. The FAO guide suggests using geospatial data, including satellite imagery and environmental indicators, to strengthen survey data in quasi-experimental designs. The study lacks geospatial data, but future research should consider adding these tools to measure environmental outcomes with greater precision (Food and Agriculture Organization of the United Nations, 2024). The public agricultural extension services in Bosnia and Herzegovina are underdeveloped and poorly coordinated. They often focus on administrative tasks rather than field-based support, resulting in limited knowledge transfer and slow technological adoption. This institutional weakness hampers the dissemination of climate-resilient practices and innovations (Žurovec, Vedeld, & Sitaula, 2015).

The research design follows the NRLP evaluation, which employed a difference-in-difference approach by analysing phased implementation across villages and blocks to determine causal effects. The NRLP study highlighted the need for stratified sampling and institutional heterogeneity when evaluating program outcomes (Kochar, 2020). The innovation ecosystem perspective supports this approach because it shows how inputs interact with institutions to produce outcomes.

To complement the statistical evaluation, the Theory of Change framework can be applied to map the causal logic of livelihood interventions, making explicit the assumptions, risks, and feedback loops that influence long-term outcomes. The following figure presents a Theory of Change model adapted for livelihood interventions in Bosnia and Herzegovina. It outlines the logical flow from inputs and activities to outputs and long-term outcomes, while the integrating contextual factors such as institutional support and climate vulnerability.

Figure 2: Theory of Change model for livelihood interventions in Bosnia and Herzegovina



The statistical evaluation can be enhanced by using the Theory of Change framework to visualise the causal pathways of the livelihood interventions while making explicit the assumptions and risks and feedback loops that affect long-term outcomes. The Theory of Change (ToC) framework provides a dynamic participatory method for assessing complex rural development interventions. The ToC framework differs from standard logical frameworks because it focuses on tracing cause-effect relationships and stakeholder beliefs and continuous improvement processes. Through this framework implementers can show how particular livelihood interventions such as greenhouse farming or beekeeping result in long-term outcomes including better food security and social cohesion and increased resilience. The approach works best in Bosnia and Herzegovina and similar post-conflict and climate-vulnerable areas because it requires adaptive management and stakeholder ownership (Starr, 2019).

The Sustainable Livelihood Pilot (SLP) in Uganda provides evidence that literacy improves the effectiveness of livelihood interventions through higher household spending on education health and water. The research by Wokadala et al. (2020) indicates that literate participants boosted their household spending by 49.5% and education expenses by 66.2% above non-literate participants. The evidence indicates that human capital particularly basic education should become an explicit component of the Theory of Change to enable income growth to produce better well-being outcomes. The addition of literacy as a mediating variable enhances the logical connection between livelihood interventions while matching the Sustainable Livelihoods Framework's perspective on human capital as a resilience and empowerment driver (Wokadala, Ssesanga, & Akampwera, 2020).

According to (Di Sabato, 2022), innovation performance depends on R&D spending but also requires a complete ecosystem that includes education and digital skills and institutional support. The study should include a Theory of Change diagram to show how project inputs (training, assets) produce long-term outcomes (resilience, income stability) through institutional and social mechanisms (Di Sabato, 2022). The use of randomised controlled trials is not always possible, so researchers use quasi-experimental methods, including difference-in-difference (DiD), propensity score matching (PSM), and regression discontinuity design (RDD) to estimate causal impacts in agricultural settings (Food and Agriculture Organization of the United Nations, 2024).

This flexible multi-tool approach ensures methodological rigour while allowing for adaptability as new tools or techniques are mastered during the research. Statistical significance will be tested at the 5% level ($p < 0.05$), and results will be presented with 95% confidence intervals as appropriate. This methodological approach enables a comprehensive and statistically valid evaluation of the long-term effects of livelihood interventions, thus providing action-oriented information to policymakers and practitioners working in rural development and sustainable livelihood programs.

The research follows the principles of decision-focused evaluations (DFEs), which focus on serving implementers and policymakers according to current development evaluation best practices. The main purpose of DFEs is to support particular programmatic choices while respecting time limitations and budget constraints, and operational requirements (Shah, 2015). In the case of Bosnia and Herzegovina, the author (Žurovec & Vedeld, Rural livelihoods and climate change adaptation in laggard transitional economies: A case from Bosnia and Herzegovina. Sustainability, 2019) explained that adaptation strategies operate independently and respond to local needs with the available resources. The effectiveness of community resilience strategies remains limited because they need institutional backing and integration into national development policies.

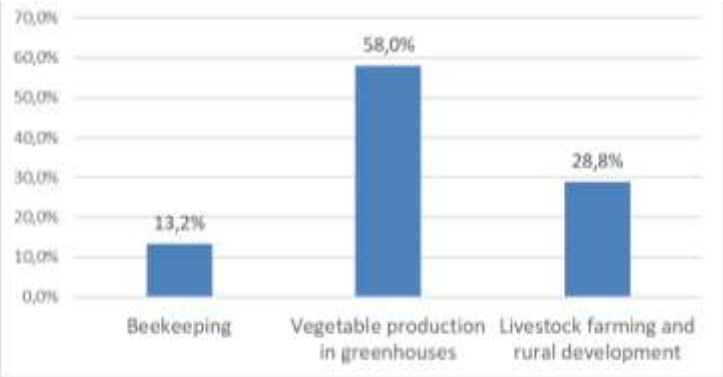
The Jeevika evaluation shows how randomised controlled trials work best with qualitative ethnographic methods to measure both quantitative results and social changes. The mixed-methods research design enabled researchers to determine both the changes that occurred and the mechanisms behind them, which provides a framework for future livelihood intervention assessments in Bosnia and Herzegovina (Hoffmann, 2018).

ANALYSIS AND FINDINGS

The majority of assistance went to greenhouse vegetable production according to the beneficiary data. The surveyed participants who received assistance through this single activity

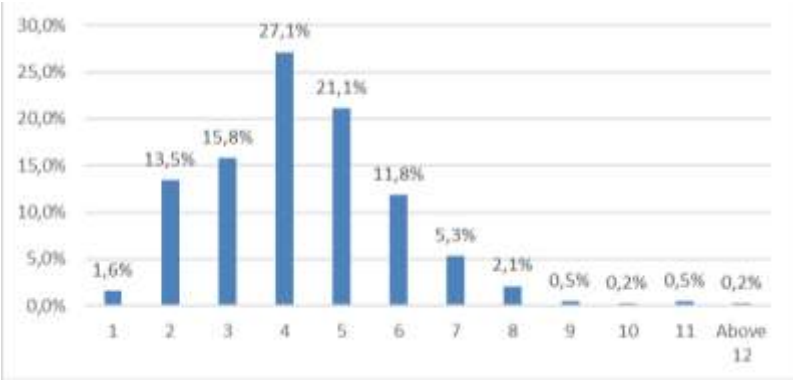
made up 58.0% or n=250 of the total participants. The second-largest group of beneficiaries received assistance for livestock farming and rural development, which included 28.8% of participants or n=124. The smallest group of respondents, representing 13.2%, received support for beekeeping (57).

Figure 3: Type of assistance received by person/family



The distribution of assistance types demonstrates a strategic emphasis on greenhouse production, which supports the Sustainable Livelihoods Framework (SLF) by improving physical capital (infrastructure) and human capital (training) access. The specific support follows global best practices for asset-based rural development interventions as described.

Figure 4: Household size of beneficiaries



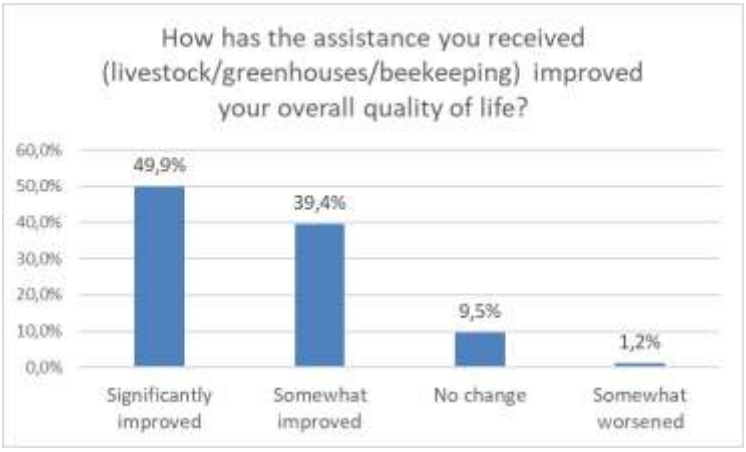
The large number of medium-sized households (3–5 members) indicates that there is potential for intra-household labor allocation which is important for maximizing the productivity of livelihood assets. This demographic structure supports the SLF's focus on household-level capabilities and labor as key livelihood assets.

Table 1: Categorization of Monthly Household Income

What is the total monthly income or budget of your household?	
0-100 KM	18,6%
101-300 KM	3,2%
301-500 KM	4,9%
501-700 KM	15,5%
701-900 KM	3,7%
901-1100 KM	6,0%
1101-1300 KM	5,6%
1301-1500 KM	3,7%
1501-1700 KM	0,7%
1700-1900 KM	0,9%
1901-2100 KM	1,9%
2101-2300 KM	0,7%
2301-2500 KM	0,2%
2501-2700 KM	0,2%
2700-2900 KM	1,2%
2901-3100 KM	0,2%
Above 3101 KM	0,0%
Does not want to share data	32,5%

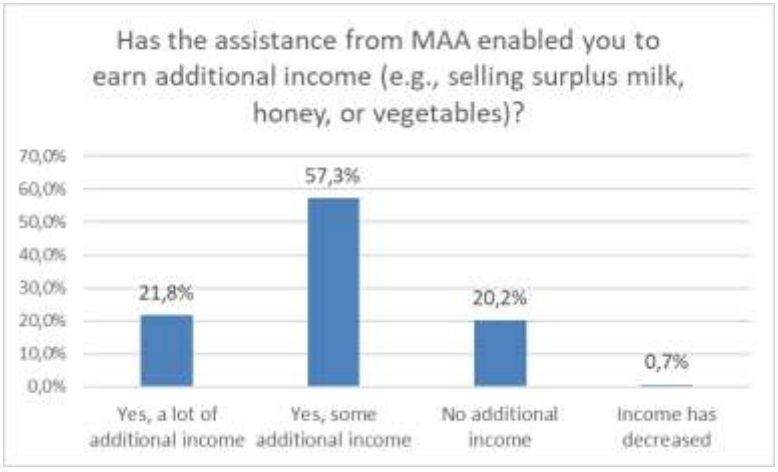
The income distribution shows that the program targeted economically vulnerable households because 18.6% of the population earned less than 100 BAM, and 32.5% refused to disclose their income which suggests that they are sensitive and financially insecure.

Figure 5: Assessment of improvement in overall quality of life



The high percentage of beneficiaries reporting improved quality of life supports the SLF's multidimensional view of well-being, which includes not only income but also food security, empowerment, and reduced vulnerability. These findings also echo results from the NRLP in India, where structured livelihood support led to broad improvements in household welfare (Kochar, 2020).

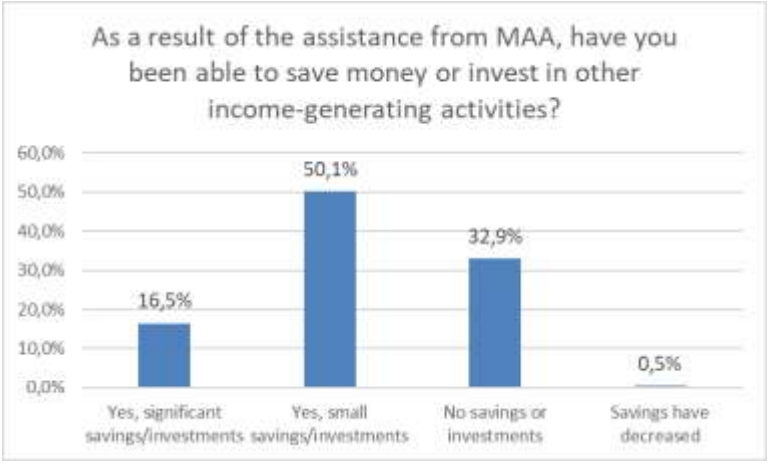
Figure 6: Ability to earn additional income



The economic empowerment potential of livelihood interventions is supported by the income gains reported by nearly 80% of households. The Graduation Approach and SLF support this finding because they focus on productive asset transfers and training as essential for sustainable income generation (J-PAL, 2015).

Beyond income, food security is another critical indicator of household well-being influenced by livelihood support.

Figure 7: Ability to Save or Invest as a Result of Assistance



The ability to save or reinvest income functions as a fundamental measure of financial resilience. The SLF explains that the building financial capital serves as an essential method to reduce vulnerability and enable long-term planning. The research results validate previous studies conducted in Bangladesh and Uganda which showed that saving money produces better household stability (Volpenhein, et al., 2022); (Wokadala, Ssesanga, & Akampwera, 2020).

Table 2: Identified Opportunities for Additional Income

What additional income opportunities have arisen as a result of the assistance from MAA?	
Sale of products to neighbours	78,7%
Sale of products on the local domestic market	19,3%
Improvement in household savings and financial stability	4,6%
Sale of products to larger supermarkets	3,0%
Investment in farm or home infrastructure improvements	1,4%
Sale of products to cooperatives	1,2%
Starting a small business	1,2%
Diversification of income sources	0,5%
Employment opportunities	0,5%
No additional opportunities	16,7%

The reported outcomes show that 32.0% of beneficiaries were able to support their children's access to secondary or higher education and 10.9% engaged in peer networking which demonstrate significant gains in both human and social capital. These findings are consistent with the Sustainable Livelihoods Framework (SLF) which highlights the importance of education and social connectedness in building long-term resilience and adaptive capacity. Such outcomes suggest that livelihood interventions can generate intergenerational benefits and foster knowledge diffusion within rural communities, thereby contributing to more inclusive and sustainable development trajectories.

Table 3: Identified additional Opportunities for Additional Income

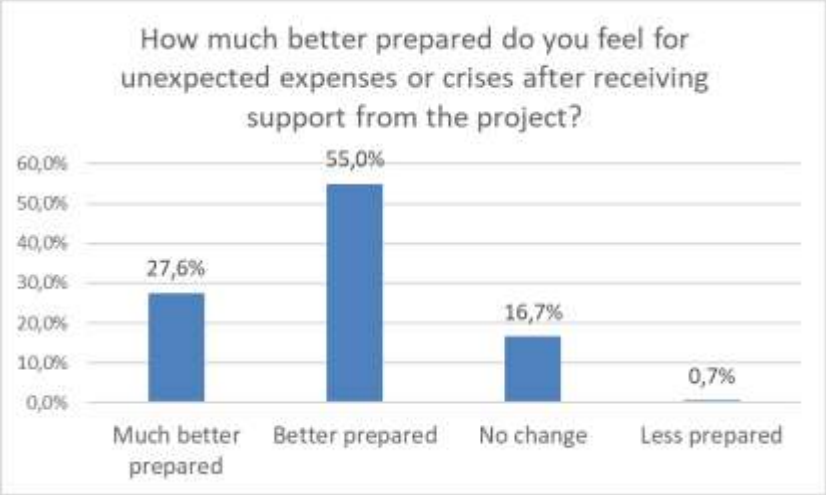
What other opportunities have arisen as a result of the assistance from MAA?	
Support for children to obtain secondary vocational or higher education	32,0%
Networking with other farmers or producers for joint growth	10,9%
Sharing my knowledge and helping others in the community to start similar ventures	10,2%
Improving reputation or recognition in the community	6,0%

I receive additional support from other organizations to expand my production	5,6%
Access to agricultural training or certifications	5,3%
Learning and adopting new technology for agriculture/production	5,1%
Participation in community development projects or initiatives	3,2%
Developing leadership skills or taking on roles in the community	0,2%
No additional opportunities	46,6%

Table 3…

The program achieved two important outcomes by enabling 32.0% of beneficiaries to fund their children's education beyond primary school and by supporting 10.9% of participants in peer networking and collaborative learning activities. The Sustainable Livelihoods Framework (SLF) supports these results because it recognizes education and social cohesion as essential factors for building long-term resilience. The research indicates that livelihood interventions produce economic benefits in the short term while creating developmental effects that improve social mobility between generations and build community-based knowledge systems.

Figure 8: Feeling of Preparedness for Unexpected Expenses and Crises



Improved preparedness for shocks reflects enhanced resilience, a core outcome of the SLF. This finding is consistent with the Enhanced Rural Resilience in Yemen (ERRY) program, which showed that livelihood support can significantly improve households' ability to cope with crises (UNDP, 2019).

Figure 9: Impact of Assistance on Confidence in Overcoming Challenges

The psychosocial effects of livelihood interventions become evident when beneficiaries show increased self-efficacy. (Esteves, 2024) supports this by stating that resilience consists of material assets together with confidence and agency. The achievement of empowerment outcomes stands as a crucial factor for maintaining long-term development gains.

Table 4: New Skills and Knowledge Gained Through the Project

What new skills or knowledge have you gained as a result of MAA assistance that help you become more resilient?	
Agriculture – vegetable cultivation	60,8%
Greenhouse management	28,1%
Agriculture – livestock farming	27,8%
Plant propagation techniques	19,3%
Animal care	15,5%
Land management and composting	15,5%
Beekeeping practices	12,1%
Water conservation techniques	10,7%
Crop rotation and planning	7,7%
Food and nutrition planning for livestock	7,4%
Honey extraction and processing	4,9%
Marketing and sales	3,0%
Equipment maintenance and repair	2,3%
Community cooperation and resource-sharing strategies	2,1%

Pest and disease control	1,2%
Financial management	0,9%
Record keeping and production data monitoring	0,7%
Use of sustainable and environmentally friendly practices	0,5%
Efficient resource management (e.g., animal feed, seeds, water)	0,5%
Harvesting and post-harvest handling	0,2%

Table 4…

The survey results show that beneficiaries learned more about vegetable cultivation (60.8%) and livestock care (27.8%) than business skills, since only 3.0% gained marketing skills and 0.9% learned financial management. The interventions successfully improved technical skills but failed to provide commercial and managerial skills which are essential for sustainable enterprise expansion. The Sustainable Livelihoods Framework requires beneficiaries to develop financial and human capital skills to move from subsistence production to market-oriented livelihoods.

Table 5: Improvement of Communication and Cooperation with Social Actors

Has the project and the assistance you received increased and improved communication and cooperation with the following social actors?	
To neighbours and the local community	92,8%
To other producers like yourself	20,4%
To associations and organizations	13,0%
To local authorities	9,3%
To local businesses	2,6%
To cooperatives	0,7%
To environmental protection groups	0,2%

The intervention achieved an exceptionally high rate of improved communication with neighbours and the local community at 92.8% which demonstrates strong grassroots impact that built localised social cohesion and mutual support networks. The formal institutions, including cooperatives (0.7%), local businesses (2.6%) and authorities (9.3%), show some very low engagement levels, which indicates a significant systemic integration gap.

The project achieved successful bonding social capital development but failed to create bridging and linking capital, which are necessary for impact expansion and institutional resource access and governance system integration according to the Sustainable Livelihoods Framework.

Hypothesis 1: Improvement in Household Financial Well-being

The first hypothesis (H1) assesses if the project led to statistically meaningful improvements in the stability of household incomes among recipients. A single identical metric allowed for direct pre-test/post-test comparison was not possible because of the nature of the data available.

The research adjusted its analysis to evaluate how beneficiaries' financial state at the start compared to their reported income variation after the intervention. This method maintains the core focus of H1 by evaluating whether the project generates positive financial results. The analysis utilised two statistical techniques: Spearman's Rank-Order Correlation and the Chi-Square Test for Independence to achieve this.

Two ordinal variables from the survey questionnaire served as the basis for the analysis.

The first independent variable functioned as an indicator of pre-project financial standing through the survey question "Does your monthly income cover all necessary household expenses?". The survey asked participants to choose between "Yes," "Partially" and "No" to indicate their household's financial situation before project completion.

The dependent variable measured perceived income change through the survey question "By how much did your household's income increase as a result of the help received from MAA?". The original response categories were "More than 50%", "25-50%", "Less than 25%", "No increase," and "Decreased."

The researchers conducted data preparation by performing recording to achieve better results interpretation. The researchers applied numerical value increases to transform both variables into more positive outcome indicators.

The dependent variable income increase received new ordinal labels through recording which transformed "More than 50%" to "Significantly," "25-50%" to "Moderately," "Less than 25%" to "Slightly," "No increase" to "Not at all" and "Decreased" to "Decreased." The scale now shows outcomes in order from most negative to most positive.

Spearman's Rank-Order Correlation: This non-parametric test was chosen to measure the strength and direction of the monotonic relationship between the two ordinal variables: initial financial status and the level of income increase. The test evaluates whether a better initial status leads to higher reported income growth.

The Chi-Square Test for Independence served as an additional analysis to establish whether there was a statistically significant relationship between the two variables. This test shows if income increase patterns depend on the initial financial status of households.

A Spearman's rank-order correlation examined the connection between beneficiaries' pre-project financial status (Monthly income (before) and their reported income growth following the project (Monthly income (after)).

Table 6: Spearman's Correlation Between Monthly Income Before and After the Intervention

Correlations				
Spearman's rho			Monthly income (before)	Monthly income (after)
	Monthly income (before)	Correlation Coefficient	1,000	.143**
	Monthly income (after)		.143**	1,000

***. Correlation is significant at the 0.01 level (2-tailed).*

The analysis of the 431 responses revealed a statistically significant, positive correlation between the two variables. The Spearman's correlation coefficient was *R*s = .143, with a p-value of .003. The p-value (Sig.) is .003, which is less than the standard alpha level of .05. This indicates that the relationship between the initial financial status and the subsequent income increase is statistically significant. We can be confident that this relationship is not due to random chance. The correlation coefficient (.143) is positive. Based on the variable coding, where a higher value represents a more positive outcome, this suggests that beneficiaries who reported a better initial financial status (i.e., were more able to cover their expenses) also tended to report a higher level of income increase after receiving assistance. The magnitude of the correlation coefficient, *r*est = .143, indicates a very weak positive relationship according to common interpretation guidelines. While the association is statistically significant, the initial financial status is a very weak predictor of the level of income increase. The SLF's focus on inclusive access to financial capital is supported by this because well-targeted interventions can help households with limited initial resources to benefit.

The analysis provides partial support for Hypothesis 1. There is a statistically significant association between the beneficiaries' initial financial situation and the income improvement they reported after the project. However, the very weak strength of this relationship suggests that the initial financial status is not a strong determinant of the project's impact on income growth. The project's benefits in terms of income increase were experienced across different initial financial levels, with only a very slight tendency for those better off initially to report a higher increase.

Additionally, a chi-squared test for independence was performed to examine whether there is a statistically significant association between the beneficiaries' initial financial status and the level of income increase they reported after the project.

Table 7: Chi-Square Test of Association

	Value	ds	Aseem. Sig. (2-sided)
Pearson Chi-Square	19.593[a]	8	,012
Likelihood Ratio	20,685	8	,008
Linear-by-Linear Association	10,342	1	,001
N of Valid Cases	431		

The test was statistically significant, indicating that the two variables are not independent. The Pearson Chi-Square value was 19.593 with 8 degrees of freedom, and a p-value of .012. The Linear-by-Linear Association test, which is sensitive to trends in ordinal data, was also highly significant (p = .001). The results are presented in the table above.

The chi-squared test for independence corroborates the findings from the correlation analysis. It confirms with statistical confidence that the beneficiaries' reported income change is not random but is significantly associated with their initial financial status. The SLF acknowledges vulnerability context and the need for customized support to achieve equitable outcomes.

Hypothesis 2: Predicting the Adoption of Good Ecological Practices

The model's dependent variable measures the extent to which participants adopted ecological practices from the project guidelines. The analysis required converting the three-category ordinal variable into a binary (dichotomous) variable. The two original response options, "Yes, regularly" and "Yes, sometimes", were merged into a single "Yes" category, which indicated practice adoption. The "No" response kept its position as the second category labelled "No".

The model included three independent variables (predictors) to forecast the outcome: The gender variable exists as a nominal scale with two distinct categories (Male/Female). The age variable exists as an ordinal scale with six distinct categories (18-25, 26-35, 36-45, 46-55, 56-65, above 65). The Type of Assistance variable functions as a nominal scale, which identifies three different project assistance categories:

- Beekeeping
- Vegetable production in greenhouses
- Livestock farming and rural development

The research used SPSS to run an Ordinal Logistic Regression analysis. The statistical method was appropriate because the dependent variable exists on an ordinal scale. The model evaluates how Gender and Age, together with Type of Assistance, affect the probability of beneficiaries advancing to higher practice adoption categories (e.g., from "No" to "Yes, sometimes" or from "Yes, sometimes" to "Yes, regularly").

Table 8: Model Fitting Information for the Ordinal Regression Model

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	ds	Sig.
Intercept Only	69,058			
Final	54,244	14,814	8	,043
Link function: Logit.				

Table 9: Goodness-of-Fit Test for the Ordinal Regression Model

Goodness-of-Fit			
	Chi-Square	do	Sig.
Pearson	20,781	25	,705
Deviance	21,433	25	,668
Link function: Logit.			

The research used an Ordinal Logistic Regression to determine how gender and age, and the type of assistance received by project beneficiaries affect their adoption of good ecological practices. The first part of the analysis involved evaluating the quality of the statistical model as a whole. The results indicated that the entire model is statistically significant ($\chi^2(8) = 14.814$, $p = .043$) because the included predictors (gender, age, and type of assistance) provide a significantly better explanation of practice adoption than chance alone. The SLF supports the idea that human and institutional capital influence environmental behaviour.

The Goodness-of-Fit tests showed that the model fits the data well (Pearson, $p = .705$; Deviance, $p = .668$). The Nagelkerke R-Square value indicates that the model explains about 10.5% of the variance in ecological practice adoption. The SLF's focus on context-specific interventions is supported by this finding which shows that ecological behavior is influenced by both individual traits and the type of support received and institutional environment.

Table 10: Parameter Estimates for the Ordinal Logistic Regression Model

Parameter Estimates						
		Estimate	Std. Error	Wald	def.	Sig.
Threshold	[Climate = 1]	-1,402	,772	3,294	1	,070
Location	[Gender=1, male]	,610	,507	1,448	1	,229
	[Gender=2, female]	0[a]			0	
	[Beekeeping=1]	-,067	,581	,013	1	,908
	[Vegetable production =2]	1,711	,566	9,148	1	,002
	[Livestock farming=3]	0[a]			0	
	[Age=18-25]	18,621	0,000		1	
	[Age=26-35]	,454	,897	,256	1	,613
	[Age=36-45]	1,046	,877	1,423	1	,233
	[Age=46-55]	,864	,781	1,224	1	,268
	[Age=56-65]	,198	,731	,073	1	,786
	[Age=above 65]	0[a]			0	

The analysis proceeded to validate the entire model before examining how individual predictors affected the results. The analysis revealed that the type of assistance received proved to be the sole statistically significant factor which influenced practice adoption. The odds of applying ecological practices were significantly higher among beneficiaries who received vegetable production assistance for greenhouses (Vegetable production =2) compared to the reference group (p =.002). The demographic variables of gender and age did not show statistical significance as predictors in this model. The analysis revealed no meaningful differences between men and women or different age groups regarding practice adoption. This aligns with the SLF's focus on physical and human capital as enablers of resilience.

Hypothesis 3: Food Security and Psychological Well-being

The third hypothesis (H3) states that "Better food security leads to decreased stress and better psychological well-being". This hypothesis aims to investigate the relationship between the material advantages of the project (better food security) and its effects on the mental and emotional state of the beneficiaries. The expected relationship is a positive correlation between higher food security and better psychological outcomes (i.e., reduced stress).

The analysis used three ordinal variables from the survey, which were categorised as food security indicators and a psychological well-being indicator.

Food Security Indicators:

1. A variable measuring the perceived change in nutritional quality, based on the question, "How would you rate the nutritional quality of your food in relation to before you received help from MAA?"
2. A variable measuring the change in dietary diversity, based on the question, "Are you now able to provide your family with a more varied diet?"

Psychological Well-being Indicator:

1. A variable measuring the perceived reduction in stress and anxiety, based on the question, "Have stress or anxiety in your household decreased due to increased food and income security?"

The analysis required essential data preparation work before starting. The three ordinal variables received numerical value transformations, which established higher numbers to indicate better outcomes. The highest value in the nutritional quality assessment went to "much better", while the well-being indicator assigned its highest value to "significantly decreased" stress. The analysis uses this transformation to show positive correlations between food security improvement and well-being improvement.

The research plan specified using Spearman's Rank-Order Correlation to test the hypothesis. The analysis requires this non-parametric test because it specifically measures the strength and direction of relationships between ordinal variables. Two separate correlation tests were performed to evaluate the relationship between:

1. Nutritional Quality and Stress Reduction.
2. Dietary Diversity and Stress Reduction.

A Spearman's rank-order correlation analysis was used to evaluate whether better food security leads to decreased stress levels. The research evaluated the relationships between food security indicators (perceived nutritional quality and dietary diversity) and psychological well-being indicators (household stress reduction). The correlation matrix demonstrates powerful positive statistical relationships between these variables, which strongly support the hypothesis.

The research established a significant positive relationship between better nutritional quality and reduced stress levels (rds.(429) =.500, p <.001). The analysis showed that better dietary diversity correlated positively with decreased stress levels (rs(429) =.469, p <.001). The positive coefficients showed that better food security ratings in quality and variety corresponded to significant stress and anxiety reductions in beneficiary reports. The correlation coefficients reached .500 and .469, indicating a strong relationship between these variables.

To further illustrate the breadth of food security improvements, the following table summarizes key outcome indicators reported by beneficiary households:

Table 11: Key Outcome Indicators reported by Beneficiary Households

Indicator	% of Households
Improved food quantity	91%
Reduced food-related anxiety	94%
Ability to afford three meals/day	95%
Improved dietary diversity	92%
Improved nutritional quality	88%
Improved family-wide diet diversity	88%

The results confirm that the Sustainable Livelihoods Framework correctly views food security as a complex outcome which includes both physical access and psychological well-being.

The two food security indicators (nutritional quality and dietary diversity) showed an extremely strong correlation ($r_s(429) = .728$, $p < .001$). The strong correlation between these variables demonstrates that they effectively measure the same food security concept which enhances the validity of the research findings. The psychosocial advantages of livelihood interventions extend past financial benefits as shown by this example.

Table 12: Spearman's Correlations Between Food Security Indicators and Psychological Well-being

		Perceived nutritional quality	Dietary diversity	Psychological well-being
Spearman's rho	Perceived nutritional quality	1,000	.728**	.500**
	Dietary diversity	.728**	1,000	.469**
	Psychological well-being	.500**	.469**	1,000

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 4: Social Cohesion and Community Relationships

The fourth hypothesis (H4) posits that "Participation in the project is associated with improved community relationships and social cohesion". To test this, the analysis was designed

to assess whether the specific type of project assistance received by beneficiaries had a differential impact on their level of social integration and cooperation.

The specific, testable hypothesis for this analysis is: "There is a statistically significant difference in the level of improved social cooperation among beneficiaries, depending on the type of assistance they received (i.e., Beekeeping, Vegetable production, or Livestock farming)." Variables Used

- Independent Variable (Factor): The grouping variable for this analysis is the Type of Assistance, a nominal variable with three categories identifying the specific support each beneficiary received.
- Dependent Variable (Initial): The analysis is based on a set of multiple response items measuring whether the project "increased and improved communication and cooperation with [...] social actors".

A multi-step data preparation process was undertaken to create a robust dependent variable for the analysis:

1. Variable Selection: From the initial set of multiple response items concerning social cooperation, the four actors with the highest frequency of reported improvement were selected for inclusion in the analysis. This step focuses the analysis on the most prevalent areas of social impact.
2. Index Computation: To create a quantitative measure of social cohesion, a "Cooperation Index" was computed. This index was created by summing the scores of the four selected binary variables (where 1 = Improved cooperation and 0 = no improvement). The resulting index is a scale variable where each beneficiary has a score ranging from 0 (no improvement in cooperation with any of the four selected actors) to 4 (improvement in cooperation with all four selected actors).

A One-Way Analysis of Variance (ANOVA) was selected to conduct the analysis. This test is the appropriate method for comparing the mean scores of a scale-dependent variable (the Cooperation Index) across three or more independent groups (the Type of Assistance).

To provide a comprehensive analysis, a Tukey's HSD post-hoc test was also specified. This test will be used to identify exactly which specific groups differ from each other if the overall ANOVA result is found to be statistically significant.

A One-Way Analysis of Variance (ANOVA) was conducted to determine if there were statistically significant differences in the mean level of improved cooperation among the three groups of beneficiaries defined by the type of assistance they received.

The results of the ANOVA test, shown in the first table, are highly statistically significant ($F(2, 426) = 16.583$, $p < .001$). This indicates that the type of assistance beneficiaries received

has a significant impact on their level of social cohesion and cooperation. The SLF recognizes social capital as a vital livelihood asset which program design affects.

Table 13: One-Way ANOVA Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12,193	2	6,097	16,583	,000
Within Groups	156,618	426	,368		
Total	168,811	428			

Table 14: Post Hoc Test (Turkey)

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Beekeeping	Vegetable production in greenhouses	,104	,090	,477	-,11	,31
	Livestock farming and rural development	-.280*	,098	,012	-,51	-,05
Vegetable production in greenhouses	Beekeeping	-,104	,090	,477	-,31	,11
	Livestock farming and rural development	-.384*	,067	,000	-,54	-,23
Livestock farming and rural development	Beekeeping	.280*	,098	,012	,05	,51
	Vegetable production in greenhouses	.384*	,067	,000	,23	,54

*. The mean difference is significant at the 0.05 level.

To determine exactly where these differences lie, a Tukey HSD post-hoc test was performed. The "Multiple Comparisons" table reveals the following:

- There is no statistically significant difference in the level of cooperation between the Beekeeping group and the Vegetable production group (p = .477).
- There is a statistically significant difference between the Livestock farming group and the Beekeeping group (p = .012).
- There is a highly statistically significant difference between the Livestock farming group and the Vegetable production group (p < .001).

Based on the mean differences shown in the table, the Livestock farming group reported a significantly higher level of improved cooperation than both the Beekeeping and Vegetable production groups.

These findings provide strong support for Hypothesis 4. The analysis confirms that the type of project assistance is a key factor that influences the improvement of social cohesion. The intervention in the livestock farming sector proved to be the most effective in fostering cooperation among beneficiaries and with the wider community, showing a significantly greater impact on social relationships compared to the other two types of assistance. The results indicate that particular livelihood types might better support the development of bonding and bridging social capital.

Hypothesis 5: The Relationship Between Income Growth and Reinvestment

The final hypothesis (H5) examines a fundamental economic and sustainability aspect of the project through the statement "Beneficiaries who experienced income growth are more likely to reinvest in income-generating activities or report better market access." The research examines the direct relationship between increased income and reinvestment activities. The research aims to establish whether project-generated income growth results in enduring economic behaviours, which include saving and reinvestment.

The analysis used an Ordinal Logistic Regression to determine if beneficiaries who experienced income growth would report better savings and reinvestment outcomes.

The dependent variable (outcome) consisted of an ordinal measure that assessed savings and reinvestment levels through the question "MAA assistance allowed you to save money or start new income-generating activities." The independent variable (predictor) used an ordinal scale to measure income growth based on the H1 question, "MAA help caused your household income to increase by what amount?" The dependent and independent variables received recoding to ensure that higher numerical values indicated better results in both income growth and reinvestment levels. The logical interpretation of results required this step.

The research used an Ordinal Logistic Regression to analyse how income growth affects the probability of beneficiaries reaching higher levels of savings or reinvestment.

Table 15: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	210,846			
Final	80,676	130,171	1	,000
Link function: Logit.				

The fifth hypothesis was tested through an Ordinal Logistic Regression to determine if higher income growth among beneficiaries leads to reinvestment. The statistical analysis showed that income growth explained the model behaviour because the overall model was highly significant ($\chi^2(1) = 130.171$, $p < .001$). The Parameter Estimates table showed that income growth strongly predicted both savings and reinvestment levels ($p < .001$). The positive coefficient value of 1.544 in the relationship indicates that each unit increase in reported income growth leads to significant odds of beneficiaries moving to higher reinvestment categories. The results strongly validate Hypothesis 5 by showing that project success in income growth leads to sustainable economic behaviours among beneficiaries. According to (Di Sabato, 2022), the SLF supports its claim that financial capital accumulation allows for forward-looking economic decisions. R&D expenditure is often used as a proxy for innovation input but it should be complemented by output indicators such as patent applications and human capital development. For livelihood projects, this means that financial analysis should not only look at the immediate income effects but also the long-term investments in knowledge systems and innovation capacity. The research supports the SLF principle that financial capital accumulation should be used to develop long-term resilience through reinvestment and strategic planning and innovation.

Table 16: Parameter Estimates for the Ordinal Regression Model of Reinvestment

Parameter Estimates						
		Estimate	Std. Error	Wald	df	Sig.
Threshold	[reinvestment = 1]	-1,232	,825	2,231	1	,135
	[reinvestment = 2]	4,017	,462	75,551	1	,000
	[reinvestment = 3]	6,914	,552	156,604	1	,000
Location	income growth	1,544	,151	105,293	1	,000

CONCLUSION

The research assessed the enduring consequences of livelihood programs on income stability and food security and climate resilience and community development for rural Bosnia and Herzegovina. The research uses survey data from 431 households across 62 municipalities to demonstrate how integrated livelihood programs boost household well-being and resilience.

The study showed that 80% of program beneficiaries obtained increased income, while 33% recorded rises between 25–50%. The research results match findings from the international studies. (Volpenhein, et al., 2022) showed that a graduation-based livelihood

program in Bangladesh achieved both higher income levels and better food consumption and asset diversification for participants. The research highlighted the significance of seasonal planning and asset management training and spill-over effects which led non-beneficiary households to start income-generating activities. The positive results from these programs demonstrate how well-designed livelihood programs can drive community development and resilience throughout entire communities. The Expanded Public Works Programme (EPWP) in South Africa produced similar positive results through its paired-sample t-test which showed a statistically significant improvement in livelihoods ($t(44) = 5.14$, $p < 0.0005$) with a large effect size ($\eta^2 = 0.375$). The participants experienced better access to food and education and health services. The program failed to create a lasting economic empowerment because workers received short hours and low pay and no opportunity to build assets. The research demonstrates that long-term income strategies together with community-led project development are essential for achieving sustainable results (Kanayo, Ndlovu, & Agholor, 2021). A similar intervention in rural Uganda led to a rise in median monthly income from approximately $42–$46 to $115 over 12–18 months, illustrating the potential of the livelihood programs to improve household financial stability, even when statistical significance is not achieved (Kakuhikire, 2016). The NRLP evaluation in India confirmed similar results when it showed that household income grew by 19% through structured livelihood programming and federated self-help groups (Kochar, 2020). (Orbeta, Ballesteros, Corpus, Paqueo, & Reyes, 2020) suggest that sustainability can be achieved by combining livelihood assistance with life skills coaching and savings promotion and commercial viability assessments. These lessons are highly relevant for Bosnia and Herzegovina, where market access and institutional support remain uneven.

The Philippines' SLP Seed Capital Fund generated a benefit-to-cost ratio of 0.59 which showed that program expenses exceeded program advantages. The administrative and personnel expenses for each beneficiary reached PhP4,228 which represented 42% of the total grant amount. The research indicates that microfinance institutions and social enterprises could provide more efficient and scalable livelihood support delivery methods (Orbeta, Ballesteros, Corpus, Paqueo, & Reyes, 2020).

The Uganda study indicates that the livelihood programs could unintentionally benefit the wealthier households within community groups. The SLP's benefit incidence analysis revealed that wealthier households received a slightly larger share of grant benefits because the group targeting was non-discriminatory. The study emphasizes the requirement for advanced targeting systems to achieve both equity and pro-poor results in future livelihood programming (Wokadala, Ssesanga, & Akampwera, 2020). These results carry important implications for the design and implementation of future livelihood programs in Bosnia and Herzegovina and similar contexts.

Food security improvements diretly correlated with diminished psychological stress according to the study, thus validating the psychosocial advantages of livelihood interventions (Esteves, 2024). In the paper of (Çali, 2022), the survey results indicate that both Albania and Kosovo have limited knowledge about circular economy principles, yet Kosovo residents show stronger interest in purchasing sustainable products. The willingness of consumers to pay for sustainable products rises substantially when they receive verified information about environmental impacts. The findings will help create livelihood projects that support ecological practices through market-based incentives in Bosnia and Herzegovina.

The adoption of climate-smart practices showed inconsistent results. Beneficiaries of the Greenhouse program showed better adoption of ecological practices than beneficiaries from livestock and beekeeping activities. The research demonstrates how targeted training and peer learning, along with demonstration effects, are crucial for effective large-scale implementation of sustainable practices, as (Lopez-Avila, 2017) pointed out. To enhance climate resilience in Bosnia and Herzegovina, future livelihood interventions should adopt adaptation M&E frameworks that integrate Theory of Change models, as demonstrated in Kenya and Uruguay, ensuring alignment with national adaptation plans and SDG targets. Agricultural adaptation monitoring needs a Theory of Change which connects the inputs (training and assets) to the outcomes (reduced vulnerability and improved resilience) and impacts (food security and reduced climate losses). Kenya, Uganda and Uruguay have established particular adaptation M&E systems which monitor both process and outcome indicators. The systems stress the need to link the agricultural interventions with national adaptation goals, gender-sensitive outcomes and climate risk management strategies (FAO, 2023).

The implementation of livelihood projects with climate-smart practices supports BiH's national green transition strategy. The interventions create economic benefits through lower input expenses and higher productivity levels, and EU carbon pricing compliance. The UN's Green Transition portfolio serves as a strategic framework to expand these interventions through local government partnerships and decarbonization policies (UN, 2024).

Community development outcomes achieved their greatest visibility at the grassroots level because 92.8% of survey respondents noted improved communication with their neighbours. The formal institutions and structured market systems showed limited connection with the project. The Jeevika project in Bihar demonstrated similar results when its rapid expansion led to reduced empowerment outcomes, according to (Hoffmann, 2018), indicating the necessity of local facilitation combined with institutional layering.

The Sustainable Livelihoods Framework receives support from this research because it proves that access to assets, together with institutional support and social capital, creates

essential conditions for building resilience and reducing poverty. The Philippines evaluation of the Sustainable Livelihood Program found no statistically significant impact on household income, expenditure, or savings. The program increased labor participation but the average annual net income per group member was only PhP2,748 (approx. €45) with a median of just PhP292. This indicates that labor activation alone does not guarantee economic empowerment unless supported by viable business models, market access, and sustained technical support (Orbeta, Ballesteros, Corpus, Paqueo, & Reyes, 2020).

Although, the READ SI report published by (IFAD, 2017) does not explicitly use a SWOT framework, but its strategic rationale reveals key elements:

Strengths: Proven integrated model, strong government ownership, and community-based delivery.

Weaknesses: Limited capacity in new districts, risk of elite capture, and dependency on subsidies.

Opportunities: Scaling through national platforms, digital finance, and climate-smart agriculture.

Threats: Climate shocks, market volatility, and institutional fragmentation.

(International Monetary Fund, 2018) also states that improving public investment efficiency in BiH requires institutional reforms, including better project appraisal, multi-year budgeting, and enhanced transparency. The report suggests that the systems like PIMIS should be expanded to improve the monitoring and coordination across the government levels.

The (UN, 2024) supported 239 companies in BiH that have adopted sustainable business models which demonstrates how livelihood projects can drive private sector involvement. The combination of the entrepreneurship training with the market access strategies and SME partnerships during project design will boost long-term economic sustainability. The connections between these elements play a crucial role in helping informal producers move into formal value chains. The READ SI programme focused on value chain strengthening through public-private partnerships and farmer field schools and post-harvest infrastructure. These interventions improved market access and reduced transaction costs, particularly in cocoa and rice sectors. The programme's success highlights the importance of integrating value chain mapping and market linkage strategies into livelihood project design (IFAD, 2017).

The research contains certain restrictions in its methodology. The research depends on secondary data, but it does not contain a control group, which restricts the ability to determine cause-and-effect relationships. The absence of geospatial or longitudinal data restricts researchers from studying environmental and temporal dynamics.

Future studies need to employ mixed-methods research to understand how institutional quality and market integration affect the maintenance of livelihood gains. The research should

evaluate intervention effects on various beneficiary groups while incorporating gender-based and psychological indicator data to achieve complete outcomes. (Žurovec, Vedeld, & Sitaula, Agricultural Sector of Bosnia and Herzegovina and Climate Change—Challenges and Opportunities, 2015) propose that in the future, the indicators of exposure need to be enhanced to cover agricultural drought and waterlogging, which are directly connected to crop productivity as opposed to general meteorological data. This will enhance the impact assessment to be more specific to agriculture interventions.

The study provides useful guidance to policymakers and practitioners despite its acknowledged restrictions. The research shows that post-project mentorship, together with business skills training and market access strategies, must be implemented to achieve sustainable results. The conference proceedings demonstrate how green insurance , together with financial risk management tools including liability and property and business interruption coverage protect renewable energy and sustainability projects. Financial instruments similar to those used in livelihood interventions should be integrated into projects to boost their resilience particularly in rural areas that face climate vulnerability (Shkurti & Manoku, 2022). The research results match current innovation studies, which demonstrate how institutional quality enables sustainable development results (Di Sabato, 2022) states that institutional quality through inclusive governance and transparency, and anti-corruption mechanisms, drives innovation and sustainable development. Resource-based interventions in countries with weak institutions fail to produce the sustainable outcomes. The research supports the requirement for livelihood projects to operate within strong institutional systems to achieve lasting effects (Di Sabato, 2022). The research findings will help develop rural development plans that are both inclusive and resilient and adapted to Bosnia and Herzegovina and comparable post-conflict regions.

The observations match governance literature which emphasises that inclusive institutions play a crucial role in maintaining development interventions. The Slovak case study demonstrates that inclusive institutions which provide economic opportunities to more people and minimise bureaucratic inefficiencies are vital for innovation and resilience. The argument supports the need for Bosnia and Herzegovina to back livelihood projects through institutional reforms, which promote the transparency and reduce corruption, and improve local governance (Di Sabato, 2022).

The (Gjika & Jorgji, 2022) article show that Albania's green budgeting is underdeveloped because environmental funds make up less than 0.23% of the national budget. There is no regulatory framework that mandates green budgeting, and the local governments do not have dedicated structures for environmental policy. For Bosnia and Herzegovina, integrating

livelihood projects into green public finance frameworks could enhance alignment with SDGs and improve long-term funding sustainability.

The research done by (Žurovec, Vedeld, & Sitaula, Agricultural sector of Bosnia and Herzegovina and climate change—Challenges and opportunities, 2015) identifies irrigation as a fundamental adaptation strategy to reduce drought impacts while maintaining the stable crop production in Bosnia and Herzegovina. The current irrigation coverage of arable land stands at 0.4% which falls significantly short of regional standards. The expansion of irrigation infrastructure remains vital for building resilience and maintaining food security during shifting climatic conditions.

The EU's rural development strategy for BiH prioritizes improving market access for agricultural producers by investing in infrastructure, cooperative development, and value-added activities. These interventions aim to strengthen linkages within agri-food value chains and promote competitiveness in niche markets (European Commission, 2018). The IFAD experience in Bosnia and Herzegovina reinforces this conclusion. Projects that combined credit access with technical support and flexible repayment mechanisms achieved high repayment rates and measurable improvements in productivity and income. However, challenges such as limited market access, high insurance costs, and weak institutional coordination persisted. These lessons highlight importance of designing livelihood interventions that integrate financial services with market development and institutional reform (Vaško, Omanović, Figurek, & Kosić, 2011).

The implementation of livelihood projects requires integration with new SDG financing mechanisms, including impact bonds and blended finance and strategic investment funds to achieve scalability and sustainability. The UN's backing of SDG-aligned financing instruments in BiH shows how private capital can be attracted to deliver quantifiable social and economic outcomes. Future research needs to investigate the bankability of livelihood interventions together with their compatibility with BiH's SDG Financing Framework (UN, 2024).

Future livelihood interventions need to implement blended finance models that mirror ARCP's matching grant scheme, which provides 65% investment cost coverage while requiring 35% private sector co-financing. The approach motivates private sector participation while building stronger value chains and encouraging rural business development. The gender-sensitive approach of ARCP which sets a 30% female participation target, shows how inclusive programming creates better outcomes and promotes fairness (World Bank, 2022).

POLICY RECOMMENDATIONS

- The results of this study indicate several policy directions which would improve the long-term effectiveness and sustainability of livelihood interventions in Bosnia and Herzegovina:

- The creation of formal market access through cooperative development digital traceability systems and public-private partnerships will enable beneficiaries to transition from subsistence and informal sales.
- Future programs need to extend their training scope beyond technical agriculture by adding business development and marketing and financial literacy components to support both entrepreneurship and income diversification.
- The current implementation of rural development faces challenges due to the ongoing fragmentation which occurs between administrative levels. Rural development initiatives should adopt a unified strategy that brings together entity and municipal levels to deliver better services and allocate resources more effectively.
- The program design needs to incorporate gender-inclusive elements to address structural barriers that women face in unpaid care work and leadership limitations. The program must provide flexible training schedules along with childcare support services and empowerment initiatives specifically designed for women.
- The implementation of climate-smart practices needs expansion through demonstration plots and peer learning and customized advisory services.
- Post-project support systems should be established to maintain sustainability because beneficiaries need access to mentorship programs and microfinance services as well as extension service connections.

LIMITATIONS

- The study provides important findings yet several research limitations need attention for future investigations: The absence of non-beneficiary comparison groups makes it challenging to identify intervention effects because other external factors remain confounding.
- The study depends on self-reported data which creates potential issues because respondents might recall information incorrectly or present responses they think are socially acceptable.
- The cross-sectional research design prevents researchers from measuring long-term effects and spatial differences in outcome results.
- The study provides diverse participant representation yet fails to analyze complete outcome variations across gender groups and age groups and geographic locations.

FUTURE RESEARCH

Future research needs to follow these recommended directions:

- The use of quasi-experimental techniques including propensity score matching and difference-in-differences analysis will help researchers improve their ability to establish cause-and-effect relationships.
- The inclusion of geospatial analysis will help researchers evaluate environmental and climate-related outcomes.
- Research studies should track impact duration across different time periods to understand how long-term effects persist.
- The research should investigate how gender together with age and location affect the study's findings.
- The research should evaluate both the cost-effectiveness and scalability potential of various intervention models to guide investment decisions from donors and government.

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