Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

Planting Prosperity: Financial, Institutional, and Market Determinants of Agroforestry Resilience in Khyber Pakhtunkhwa, Pakistan

Zahoor Ahmad Khan
Institute of Management Sciences-Peshawar
Professor Dr. Shabana Gul
Institute of Management Sciences-Peshawar

Abstract
This study investigates the impact of financial capital, institutional support, and market access on the livelihood resilience of smallholder agroforestry farmers in Khyber Pakhtunkhwa (KP), Pakistan. Agroforestry, integrating trees with crops and livestock, offers opportunities for income diversification, environmental conservation, and risk mitigation. Despite its potential, adoption in KP remains constrained by systemic barriers. A quantitative research design was employed, surveying 100 farmers across six districts using structured questionnaires. Descriptive statistics, correlation analysis, and multiple linear regression were applied to examine relationships among variables. Results indicate that institutional support is the strongest predictor of livelihood resilience, followed by access to financial capital and market access. Collectively, these factors account for 92.6% of variability in resilience outcomes. Findings confirm the critical role of technical training, extension services, affordable credit, and market connectivity in enhancing farmers' adaptive capacities. Policy implications include strengthening institutional outreach, developing tailored financial instruments, and improving market infrastructure to facilitate sustainable agroforestry adoption. Future research should examine longitudinal impacts, intra-household dynamics, value chain efficiencies, and climate variability on resilience.

Keywords: *Agroforestry, Livelihood Resilience, Financial Capital, Institutional Support, Market Access, Khyber Pakhtunkhwa, Smallholder Farmers*

1. Introduction

Agroforestry, the integration of trees, crops, and livestock on the same land, represents a significant approach to sustainable agriculture in developing countries. By diversifying production systems, agroforestry enables farmers to increase income, enhance food security, and mitigate environmental degradation. In Pakistan, particularly in the province of Khyber Pakhtunkhwa (KP), agroforestry is increasingly recognized as a viable

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

strategy to address persistent challenges faced by smallholder farmers, including low farm incomes, declining soil fertility, and vulnerability to climate variability. Despite its potential benefits, adoption rates of agroforestry in KP remain constrained due to financial limitations, inadequate institutional support, and restricted access to markets. This study investigates these constraints and examines their implications for household livelihood resilience.

Agriculture constitutes a critical sector in Pakistan, supporting a substantial proportion of the population. However, traditional farming practices are increasingly inadequate in addressing emerging challenges such as land degradation, water scarcity, and climate change. Agroforestry offers an alternative system that combines tree cultivation with crops and livestock, enhancing soil fertility, reducing erosion, and generating supplementary income through timber, fruits, and other tree products (Zada et al., 2022). In KP, most smallholder farmers reside in hilly and mountainous regions prone to floods, landslides, and soil erosion. Agroforestry, by improving land quality and providing multiple income streams, can mitigate these environmental risks while enhancing economic stability. Empirical evidence indicates that farmers practicing agroforestry in KP achieve higher incomes and accumulate more assets compared to those relying solely on conventional agriculture (Zada et al., 2022, p. 73; Saqib & Khan, 2022). For example, households engaged in agroforestry reported approximately six percent higher income and increased ownership of productive assets, highlighting the economic advantages of tree-based farming systems.

Despite these advantages, the widespread adoption of agroforestry in KP is limited. Financial constraints constitute one of the most significant barriers. Establishing agroforestry systems requires substantial initial investment for tree planting, irrigation infrastructure, and maintenance until trees mature and yield marketable products. Many smallholder farmers lack sufficient financial capacity and have limited access to formal credit, relying primarily on personal savings or informal lending, which restricts their ability to adopt or sustain agroforestry practices (Ali, 2021, p. 229). Institutional support for agroforestry is also inadequate. Government agencies and extension services, which could provide technical training and advisory support, are often under-resourced or absent in rural areas (Iqbal et al., 2020, p. 295). As a result, farmers frequently do not acquire the necessary knowledge or skills to optimize the benefits of agroforestry systems.

Market access further influences the adoption and effectiveness of agroforestry. Even when farmers establish tree-based systems, poor road networks, unstructured marketing channels, and reliance on intermediaries often prevent them from obtaining fair prices for their products (Ahmed et al., 2022). This reduces the economic incentive to invest in agroforestry and discourages long-term engagement in tree-based farming. Collectively,

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

financial, institutional, and market-related constraints have direct implications for the livelihood resilience of farming households. Livelihood resilience, defined as the capacity of households to withstand, adapt to, and recover from economic and environmental shocks, is critical in regions such as KP, where floods, droughts, and other natural hazards are prevalent (Rehman & Shah, 2022). Agroforestry can enhance resilience by providing multiple income streams and improving land productivity, but these benefits remain inaccessible to many farmers due to existing structural barriers.

This study examines the influence of financial capital, institutional support, and market access on the livelihood resilience of agroforestry practitioners in KP. By addressing the combined effect of these factors, the research fills a critical gap in understanding the practical constraints faced by smallholders in remote and environmentally vulnerable areas. The study provides empirical evidence linking socio-economic and institutional factors to household resilience outcomes and offers insights for policymakers, development organizations, and community-based initiatives. The findings aim to inform the design of interventions that improve access to credit, enhance technical support, and strengthen market infrastructure, thereby promoting sustainable adoption of agroforestry.

Furthermore, the study contributes to the academic literature by providing quantitative evidence on the constraints and enablers of agroforestry in KP. While prior research has documented the ecological and economic advantages of tree-based farming, limited attention has been given to the interaction of financial, institutional, and market factors in shaping household resilience. By focusing on these dimensions, the research advances understanding of the conditions under which agroforestry contributes effectively to sustainable rural development. The findings also offer practical guidance for designing farmer-oriented credit schemes, targeted training programs, and market development initiatives, which are essential for enhancing household incomes and resilience in agro-ecologically diverse regions of KP.

2. Literature Overview

This review synthesizes empirical and policy-oriented studies on agroforestry adoption in Khyber Pakhtunkhwa (KP), Pakistan, with particular attention to financial, institutional, and socio-economic determinants. The review is primarily empirical and integrative, combining quantitative and qualitative findings from national and international projects, government initiatives, and NGO-led programs. The focus is on identifying the key enablers and barriers that influence the uptake, sustainability, and livelihood outcomes of agroforestry practices in the region. By critically examining the available evidence, the review highlights persistent challenges and underexplored areas that inform the rationale and design of the present study.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

- **Financial Constraints and Access to Capital:** Financial limitations remain the primary barrier to agroforestry adoption in KP. Smallholder farmers often face high upfront costs for fencing, seedlings, labor, and other inputs, while the returns from tree-based investments are delayed, creating a mismatch between effort and immediate benefits (Zada et al., 2022). Access to formal credit remains limited, and where microfinance schemes exist, they are frequently unsuitable for long-term investments such as tree cultivation (CSAIP, 2021). Remote locations, security challenges, and low liquidity exacerbate these barriers, making agroforestry an economically risky choice despite its demonstrated potential to improve income, asset accumulation, and resilience. Empirical evidence consistently shows that financial incapacity, combined with delayed or uncertain returns, discourages farmers from sustained participation, even in areas where agroforestry can mitigate environmental and economic vulnerabilities.
- **Institutional Support and Capacity-Building:** Institutional effectiveness is a critical determinant of agroforestry success. In KP, forestry departments and extension services often struggle with understaffing, limited technical expertise, sporadic field visits, and weak follow-up mechanisms (Baig et al., 2020; Shah & Khan, 2022). Trust deficits between farmers and institutional actors further undermine adoption, as farmers perceive officials to be biased or uncommunicative (Ullah et al., 2022). Capacity-building initiatives, such as those under BTAP, are often concentrated in district centers, excluding remote communities and failing to provide essential technical training on species selection, planting techniques, spacing, and pest management (Zada et al., 2022). Insufficient institutional support contributes to high tree mortality and inconsistent adoption, highlighting the need for sustained, accessible, and technically sound extension services that are responsive to local contexts.
- **Market Access and Economic Incentives:** Economic viability is a key driver of agroforestry adoption. Farmers frequently encounter unstructured value chains dominated by intermediaries, which limit their bargaining power and reduce returns from timber, fruits, and other forest products (Ullah et al., 2022). Without access to reliable markets and supporting infrastructure, even technically sound initiatives struggle to maintain farmer participation. Studies show that programs integrating financial support with market facilitation, technical advice, and input provision achieve measurable income gains, underscoring the importance of market linkages for sustaining adoption (Shah & Khan, 2022; Zada et al., 2022). Well-structured market incentives not only enhance adoption rates but also strengthen the long-term economic sustainability of agroforestry systems.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

- **Social Dynamics and Community Engagement:** Social and community factors significantly influence agroforestry adoption. Local leadership, peer influence, and community participation can either enable or hinder uptake depending on local governance structures and cultural norms (Ali, 2011). Demonstration effects from successful local models encourage adoption by providing visible evidence of economic benefits (Baig et al., 2020). Gender dynamics further shape participation: women often contribute to tree planting and homestead forestry but are largely excluded from training and decision-making processes, limiting the reach and effectiveness of interventions (CSAIP, 2021). These social mechanisms interact with financial and institutional factors to determine both adoption patterns and program sustainability, highlighting the importance of inclusive, community-driven approaches.
- **Technical Knowledge and Capacity:** The availability of technical knowledge and skills is a cornerstone for successful agroforestry practices. Low literacy and education levels among rural farmers constrain their ability to interpret technical manuals or implement complex interventions (FAO, 2021). Top-down dissemination methods, relying solely on printed guidance or sporadic instructions, are ineffective without practical demonstrations and peer learning. Evidence suggests that repeated training, field demonstrations, and ongoing advisory support significantly improve adoption rates and reduce tree mortality (Baig et al., 2020; Ullah et al., 2022). Therefore, technical capacity-building, both at the farmer and institutional level, is essential for the long-term success of agroforestry programs.

  The literature demonstrates that the adoption and sustainability of agroforestry in KP are shaped by the complex interplay of financial, institutional, market, social, technical, and policy-related factors. While numerous studies document individual barriers or enablers, few provide integrated, quantitative analyses of how these factors collectively influence adoption, income diversification, and livelihood resilience. Additionally, gender inclusivity, digital extension, and long-term program sustainability remain underexplored. Addressing these gaps, the present study adopts a structured quantitative approach to assess the combined effects of financial access, institutional support, and market integration on agroforestry outcomes, offering practical evidence for policymakers, NGOs, and local communities.
- **Policy Frameworks, Institutional Coordination, and Program Sustainability:** While agroforestry is formally recognized in KP as a climate-smart and economically viable practice, persistent implementation gaps significantly constrain its impact. Programs such as BTAP, 10BTAP, and CSAIP have increased awareness and provided support to select communities, yet service delivery is often fragmented. Seedlings, technical training, and advisory services are frequently offered by different actors with

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

little coordination, resulting in inefficiencies and reduced effectiveness (Baig et al., 2020; Ishfaq, 2020; Government of KP, 2021). Long-term program sustainability is further compromised by reliance on short-term, project-based funding, which limits follow-up and continuity of support. Farmers' trust in institutional programs erodes when past interventions fail to meet expectations, reducing willingness to participate in future initiatives (Ullah et al., 2022). Moreover, bureaucratic bottlenecks, delays in resource allocation, and limited monitoring and evaluation mechanisms weaken adaptive learning and the ability to scale successful models (Shah & Khan, 2022).

Emerging digital solutions, including mobile-based advisory services, satellite-assisted monitoring, and online platforms for market information, offer potential to bridge these gaps. However, their effectiveness depends on literacy, connectivity, contextualization to local agro-ecological conditions, and integration with on-ground support. Integrated policy frameworks that combine financial incentives, institutional coordination, capacity-building, and monitoring mechanisms are essential for creating resilient, scalable, and sustainable agroforestry systems in KP.

- **Environmental Awareness and Land Tenure:** Environmental consciousness is increasingly shaping agroforestry adoption, as farmers respond to recurring floods, droughts, soil degradation, and deforestation pressures (KP Climate Change Policy, 2021; CSAIP, 2021). Agroforestry is recognized not only as a tool for climate resilience but also for improving soil fertility, water retention, and biodiversity. Yet, translating environmental awareness into sustained practice requires a combination of technical, financial, and institutional support. Knowledge without actionable support often leads to partial adoption, suboptimal management, or tree mortality.

  Land tenure security is a critical determinant of agroforestry investment. Farmers lacking legal rights to the land, including tenants, sharecroppers, and women with limited property ownership, are less likely to invest in long-term tree-based interventions (Ali, 2011). Insecure tenure creates high perceived risks, even when financial or technical incentives are present. Furthermore, unclear property rights and inheritance disputes can discourage intergenerational investment in agroforestry, limiting the long-term benefits for household resilience and community-level environmental sustainability. Integrating environmental education, participatory land-use planning, and tenure security mechanisms is therefore essential. Programs that provide legal support, recognize community-managed forests, or facilitate secure land use agreements alongside technical and financial support can enhance adoption, sustain ecological benefits, and improve livelihood outcomes.

The literature demonstrates that agroforestry adoption in KP is determined by the multidimensional interaction of financial, institutional, market, social, technical, policy,

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

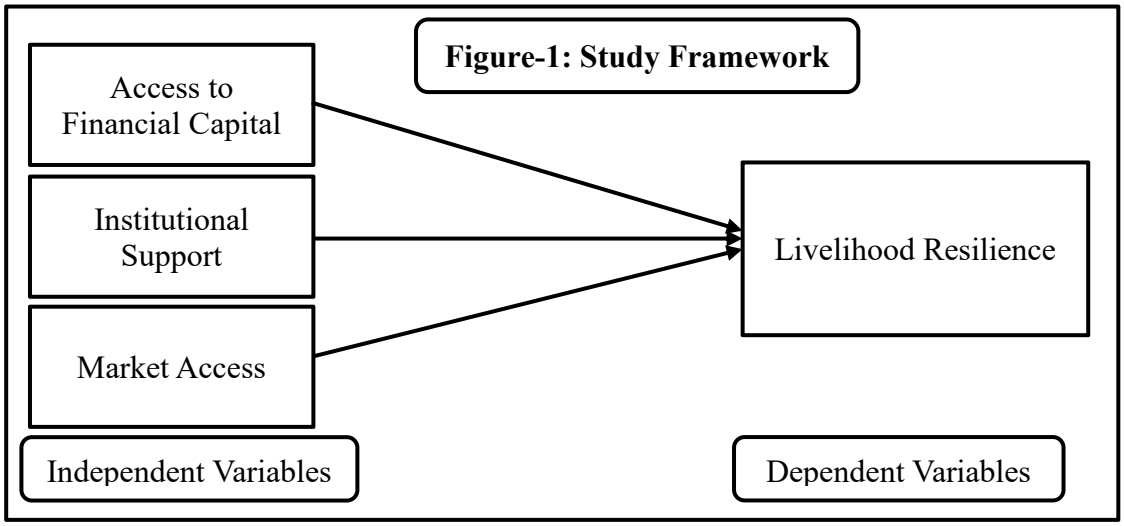
ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

and environmental factors. Although numerous studies document individual barriers or enablers, few provide integrated quantitative analyses assessing how these factors collectively influence adoption, income diversification, and livelihood resilience. Furthermore, issues such as gender inclusivity, digital extension, and long-term program sustainability remain underexplored. The present study addresses these gaps by employing a structured quantitative approach to assess the combined effects of financial access, institutional support, and market integration on agroforestry outcomes, providing actionable evidence for policymakers, NGOs, and local communities.

2.1. Conceptual Framework

The conceptual framework for this study is grounded in the literature on agroforestry adoption and livelihood resilience in Khyber Pakhtunkhwa (KP). Empirical evidence indicates that financial resources, institutional support, and market access are critical determinants influencing the ability of smallholder farmers to adopt agroforestry and enhance their livelihood resilience (Zada et al., 2022; Saqib & Khan, 2022; Ali, 2011.



Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

The framework posits that these independent variables interact to influence livelihood resilience. Individually, each factor contributes to resilience, but their combined effect is likely stronger, reflecting the multidimensional nature of adoption and sustainability in agroforestry systems.

Table-1: Research Objectives, Hypotheses, and Rationale

Research Objective	Hypothesis	Rationale
To examine the impact of access to financial capital on the livelihood resilience of smallholder agroforestry farmers in KP.	H1: Access to financial capital has a significant positive effect on livelihood resilience of agroforestry farmers in KP.	Financial resources enable farmers to procure inputs (seedlings, irrigation, fencing) and maintain tree-based farming, thereby strengthening their ability to cope with economic and environmental shocks.
To evaluate the role of institutional support (training, extension services, government programs) in the adoption and success of agroforestry systems.	H2: Institutional support positively influences the livelihood resilience of agroforestry farmers in KP.	Technical training, extension services, and institutional guidance enhance farmers' skills, knowledge, and confidence, improving adoption success and household capacity to manage risks.
To analyze how market access contributes to the economic performance and livelihood stability of farmers engaged in agroforestry practices.	H3: Market access has a significant positive effect on the livelihood resilience of agroforestry practitioners in KP.	Access to structured markets ensures fair returns for agroforestry products, incentivizes adoption, and reinforces financial and economic resilience of households.
To offer evidence-based recommendations for improving agroforestry support systems in KP.	H4: The combined effect of financial capital, institutional support, and market access significantly enhances livelihood resilience among agroforestry farmers in KP.	A synergistic approach integrating financial, institutional, and market supports addresses multidimensional barriers, leading to stronger livelihood resilience than any single factor alone.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

To empirically examine the relationships depicted in the conceptual framework, it is essential to operationalize the study variables into measurable indicators. The figure below presents a detailed operationalization, including key indicators, sample questionnaire items, and measurement scales.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

Figure-2: Operationalization of Study Variables

Access to Financial Capital *(Independent Variable-1)*	**Institutional Support** *(Independent Variable-2)*	**Market Access** *(Independent Variable-3)*	**Livelihood Resilience** *(Dependent Variable)*
Availability of formal or informal credit, subsidies, savings, and other financial instruments enabling investment in agroforestry inputs (seedlings, irrigation, fencing, labor). Critical for adoption in subsistence agricultural settings.	Encompasses extension services, training, and guidance from government or NGOs that enhance farmers' technical capacity, knowledge, and confidence. Builds trust, encourages participation, and ensures sustainability.	Ability to sell agroforestry products (timber, fruits, fodder, non-timber products) at fair prices. Well-structured market linkages enhance income, financial stability, and sustained adoption.	Capacity of agroforestry households to withstand, adapt, and recover from economic and environmental stresses, including floods, droughts, and market fluctuations. Reflects income stability, recovery from shocks, and multiple livelihood sources.
Indicators • Access to loans • Government subsidies • Affordability • Use of personal savings **Sample item:** "I can access loans or financial support for my agroforestry activities." **Measurement:** 5-point Likert scale	**Indicators** • Participation in training/workshops • Extension services received • Government/NGO guidance • Institutional follow-up & technical support **Sample item:** "Government or NGO training has helped me improve my agroforestry practices." **Measurement:** 5-point Likert scale	**Indicators** • Access to buyers • Fair pricing • Transportation availability • Market information availability **Sample item:** "I have reliable access to markets where I can sell my agroforestry products at fair prices." **Measurement:** 5-point Likert scale	**Indicators** • Income stability • Recovery from shocks • Multiple income sources • Improved standard of living **Sample item:** "Agroforestry has helped me maintain financial stability during difficult seasons." **Measurement:** 5-point Likert scale (1 = strongly disagree, 5 = strongly agree)

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 7 (August) (2025)

3. Methodology

This study employs a quantitative research design to examine the impact of financial access, institutional support, and market access on livelihood resilience among smallholder agroforestry farmers in Khyber Pakhtunkhwa (KP). The quantitative approach allows for objective measurement of relationships between variables using numerical data, enabling the application of statistical techniques to assess cause-effect linkages (Creswell, 2014).

The research is both applied and explanatory. It is applied as it addresses practical challenges faced by farmers integrating agroforestry into their livelihoods, and explanatory as it seeks to determine how financial, institutional, and market factors influence livelihood resilience. Following a positivist paradigm, the study emphasizes objective measurement and statistical analysis, ensuring replicable and generalizable findings (Creswell, 2014).

The target population comprised smallholder farmers practicing agroforestry in selected districts of KP, namely Swat, Mardan, and Upper Dir, chosen for their active participation in government and private agroforestry initiatives, including the Billion Tree Tsunami project. Purposive sampling was employed to select 100 respondents meeting the inclusion criteria of active engagement in agroforestry. This approach ensured context-specific and relevant data while providing adequate statistical power for multiple linear regression analysis (Green, 1991).

Data were collected using a structured questionnaire with items measured on a five-point Likert scale, capturing farmers' perceptions of financial access, institutional support, market access, and livelihood resilience. This enabled consistent quantification of attitudes and facilitated statistical comparison across respondents.

Analysis was conducted using Jamovi software. Descriptive statistics summarized trends in the data, while correlation analysis examined the strength and direction of relationships between independent variables and livelihood resilience. Multiple linear regression tested the study's hypotheses, assessing the significance and magnitude of effects. Reliability analysis using Cronbach's Alpha confirmed internal consistency for each construct, with α values above 0.7 considered acceptable (Tavakol & Dennick, 2011).

By combining a robust sampling strategy, structured measurement, and rigorous statistical analysis, the methodology ensures the reliability, objectivity, and practical relevance of findings, providing a solid foundation for understanding the determinants of livelihood resilience among agroforestry farmers in KP.

4. Results

The data for this study were collected from 100 smallholder agroforestry farmers across six districts of Khyber Pakhtunkhwa. Table-2 presents the frequency distributions of age, gender, education, district, landholding size, and agroforestry experience. The largest age group falls between 18–30 years (30%), closely followed by farmers above 60 years (29%), indicating strong participation by both younger and older farmers. The gender distribution is highly skewed toward males (91%), highlighting limited female engagement in agroforestry. Education levels vary, with 25% having no formal education and 22% possessing a graduate-level or

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 7 (August) (2025)

higher education, demonstrating a diverse range of educational backgrounds among practitioners. Upper Dir has the highest representation (24%), followed by Mardan (19%) and Swat (17%), reflecting active agroforestry participation in these districts. Landholding sizes indicate that 40% of farmers own more than five acres, which facilitates the adoption and expansion of agroforestry systems, while smaller landholders constitute 60% of the sample. In terms of experience, 28% of respondents had less than one year of involvement in agroforestry, whereas 54% had more than four years, signaling both recent adoption trends and long-term engagement. This demographic profile establishes the context for understanding the effects of financial access, institutional support, and market connectivity on livelihood resilience.

Table-2: Frequency Distribution of Respondents' Demographics

Variable	Categories	Count	Percentage (%)
Age	18–30	30	30.0
	31–45	17	17.0
	46–60	24	24.0
	Above 60	29	29.0
Gender	Male	91	91.0
	Female	9	9.0
Education Level	Graduate and above	22	22.0
	Intermediate	20	20.0
	Matric	15	15.0
	Primary	18	18.0
	No formal education	25	25.0
District	Bannu	12	12.0
	Buner	14	14.0
	Charsadda	14	14.0
	Mardan	19	19.0
	Swat	17	17.0
	Upper Dir	24	24.0
Landholding Size	<1 acre	27	27.0
	1–5 acres	33	33.0
	>5 acres	40	40.0
Agroforestry Experience	<1 year	28	28.0
	1–3 years	18	18.0
	4–6 years	27	27.0
	>6 years	27	27.0

Descriptive statistics were calculated to summarize central tendencies and variability across the key variables. Table-3 presents the means, medians, standard deviations, and range of responses for Access to Financial Capital, Institutional Support, Market Access, and Livelihood Resilience. The mean score for Access to Financial Capital is 3.20 (SD = 0.837), indicating a moderately positive perception of financial accessibility among farmers. Institutional Support has a mean of 3.02 (SD = 0.798), reflecting a neutral to slightly positive view of training, extension, and institutional engagement. Market Access shows a mean of 3.13 (SD = 0.895),

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 7 (August) (2025)

suggesting moderate satisfaction with the availability of markets and fair pricing. The dependent variable, Livelihood Resilience, has a mean of 2.97 (SD = 0.824), indicating that while some farmers perceive agroforestry as improving their resilience, others remain neutral or uncertain.

Table-3: Descriptive Statistics of Key Variables

Variable	N	Mean	Median	SD	Min	Max
Access to Financial Capital	100	3.20	3.29	0.837	1.14	5.00
Institutional Support	100	3.02	3.14	0.798	1.00	4.71
Market Access	100	3.13	3.14	0.895	1.00	5.00
Livelihood Resilience	100	2.97	3.00	0.824	1.14	5.00

Reliability analysis using Cronbach's Alpha confirmed the internal consistency of measurement scales. All variables exceeded the 0.70 threshold, with Access to Financial Capital (α = 0.877), Institutional Support (α = 0.840), Market Access (α = 0.917), and Livelihood Resilience (α = 0.846), indicating that the items reliably measured the intended constructs and were suitable for further statistical analysis.

Table-4: Reliability Analysis

Variable	Cronbach's Alpha (α)
Access to Financial Capital	0.877
Institutional Support	0.840
Market Access	0.917
Livelihood Resilience	0.846

Correlation analysis (Table-5) revealed strong positive relationships between all independent variables and the dependent variable. Institutional Support showed the strongest correlation with Livelihood Resilience (r = 0.934), followed by Access to Financial Capital (r = 0.912) and Market Access (r = 0.865). The independent variables were also highly interrelated, suggesting that financial resources, institutional engagement, and market connectivity collectively reinforce farmers' capacity to maintain resilient livelihoods.

Table-5: Correlation Analysis

Variables	1	2	3	4
1. Access to Financial Capital	1.000			
2. Institutional Support	0.857	1.000		
3. Market Access	0.877	0.799	1.000	
4. Livelihood Resilience	0.912	0.934	0.865	1.000

Multiple linear regression was conducted to assess the predictive power of the independent variables on Livelihood Resilience. The model explained 92.6% of the variance (R^2 = 0.926, F = 399, p < 0.001), indicating an excellent fit. Table-6 presents regression coefficients, showing that Institutional Support (β = 0.559, p < 0.001) was the strongest predictor, followed by Access to Financial Capital (β = 0.293, p < 0.001) and Market Access (β = 0.158, p = 0.004). These findings confirm all three hypotheses, demonstrating that financial resources, institutional engagement, and market access significantly enhance the livelihood resilience of

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 3 No. 7 (August) (2025)

agroforestry farmers in Khyber Pakhtunkhwa, with institutional support playing the most critical role.

Table-6: Regression Coefficients Predicting Livelihood Resilience

Predictor	B (Estimate)	SE	t	p-value
Intercept	−0.146	0.0933	−1.56	0.122
Access to Financial Capital	0.293	0.0676	4.33	<0.001
Institutional Support	0.559	0.0567	9.86	<0.001
Market Access	0.158	0.0542	2.91	0.004

Overall, the analysis confirms that access to financial capital, institutional support, and market connectivity are significant determinants of livelihood resilience. Institutional support emerges as the most influential factor, emphasizing the importance of training, extension services, and policy-backed interventions to strengthen farmers' adaptive capacities. These results provide a robust empirical basis for targeted policy measures aimed at enhancing agroforestry adoption and rural livelihoods in the region.

5. Discussion

This study investigated the impact of access to financial capital, institutional support, and market access on the livelihood resilience of agroforestry farmers in Khyber Pakhtunkhwa (KP), Pakistan. Agroforestry is increasingly recognized as a strategic practice for sustainable land management, environmental conservation, and rural livelihood enhancement. Despite its potential, adoption in KP remains limited due to systemic challenges, including restricted financial services, inconsistent institutional support, and fragmented market linkages. The study aimed to empirically test how these enabling factors shape farmers' capacity to withstand, adapt, and recover from economic and environmental shocks, aligning with the research objectives of understanding determinants of rural livelihood resilience.

Access to financial capital was found to significantly enhance livelihood resilience ($\beta = 0.293$, $p < 0.001$), confirming Hypothesis 1. Farmers with better access to loans, subsidies, and affordable credit were able to invest in critical agroforestry inputs such as seedlings, irrigation systems, and fencing. These investments not only improve immediate productivity but also strengthen farmers' adaptive capacity against shocks. This finding aligns with Ali (2021), who emphasized that limited financial resources constrain smallholder investment and resilience. It demonstrates that financial capital serves as both a necessary resource for operational needs and a strategic enabler of long-term livelihood stability.

Institutional support emerged as the strongest predictor of livelihood resilience ($\beta = 0.559$, $p < 0.001$), validating Hypothesis 2. The strong correlation between institutional support and resilience ($r = 0.934$) highlights the importance of training programs, extension services, and government or NGO interventions in equipping farmers with technical knowledge and confidence for effective agroforestry adoption. This finding supports Iqbal et al. (2020) and Mahmood et al. (2022), who noted that institutional engagement promotes crop diversification, climate-smart practices, and overall income stability. Institutional mechanisms

ISSN Online: 3007-3154
ISSN Print: 3007-3146

thus provide more than guidance—they build trust, enhance decision-making, and ensure sustainability, which are central to the study objective of evaluating systemic support mechanisms.

Market access also demonstrated a significant positive relationship with livelihood resilience ($\beta = 0.158$, $p = 0.004$), confirming Hypothesis 3. Farmers who could access fair markets, transport produce efficiently, and obtain timely information were better able to secure income stability and mitigate risks. While the effect size was smaller than that of financial capital and institutional support, the results highlight the role of market integration in translating investments and technical knowledge into tangible livelihood outcomes. This observation corroborates Ahmed et al. (2022), who emphasized that infrastructure gaps, middlemen exploitation, and limited market information undermine the profitability of agroforestry.

The analysis also revealed that financial capital, institutional support, and market access are interrelated, suggesting that resilience is shaped by the interaction of these factors rather than by any single element. Financial access enhances the ability to invest in agroforestry inputs, which is most effective when combined with institutional knowledge and market opportunities. The high adjusted R^2 value of 0.926 indicates that these variables collectively account for a substantial portion of variability in livelihood resilience, validating the integrated conceptual framework proposed in this study.

The findings confirm that promoting agroforestry-based resilience requires coordinated action across financial, institutional, and market dimensions. Institutional support provides the technical knowledge and confidence necessary for adoption, financial access ensures that inputs and investments are feasible, and market access enables the realization of economic benefits. This integrated perspective aligns with the study's objectives and reinforces the relevance of a holistic approach to enhancing rural livelihood resilience in KP.

6. Conclusion and Future Research Insights

In conclusion, this study establishes that livelihood resilience among agroforestry farmers in KP is significantly shaped by institutional support, financial access, and market connectivity. Institutional support emerged as the most influential factor, emphasizing the importance of training, extension services, and continuous engagement for sustainable adoption. Access to financial capital enables farmers to invest in critical agroforestry inputs, while market access ensures the economic viability of their efforts. Collectively, these factors explain a substantial portion of the variation in livelihood resilience, highlighting the multidimensional nature of rural sustainability.

The research provides practical implications for policymakers and development practitioners: interventions should prioritize strengthening institutional capacities, designing tailored financial products, and improving market infrastructure. Additionally, attention to gender-inclusive programs and education-focused initiatives can further enhance resilience outcomes, ensuring equitable access to agroforestry benefits.

Future research could explore several areas to build upon these findings.

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

Longitudinal studies are recommended to assess the long-term impact of financial, institutional, and market support on resilience trajectories. Investigating the role of intra-household dynamics, particularly gender and education, could offer deeper insights into how internal household capabilities interact with external support. Further studies could also incorporate value chain analysis to understand market inefficiencies and pricing mechanisms more comprehensively. Finally, examining the influence of climate variability and environmental shocks on agroforestry adoption will provide a more holistic understanding of factors shaping rural livelihood resilience in KP and similar contexts.

References

Ahmed, A., & Yaseen, M. (2021). Climate-smart agroforestry practices and their impact on rural livelihoods in Pakistan. *International Journal of Climate Resilience in Agriculture, 12*(2), 102–116.

Ahmed, N., Zaman, K., Tariq, S., & Gul, H. (2022). Market access and pricing constraints in Pakistan's agroforestry sector: An empirical review. *Journal of Agricultural Economics and Rural Development, 10*(1), 55–68.

Ali, A. (2021). Financial barriers in adopting agroforestry: A case of smallholder farmers in Khyber Pakhtunkhwa. *Journal of Rural Development and Policy, 15*(3), 225–238.

Asfaw, S., & Simane, B. (2020). Institutional gaps and smallholder climate resilience in agroforestry systems: Evidence from Ethiopia. *Environmental Management and Policy Journal, 28*(2), 148–162.

Asrat, P., & Simane, B. (2023). Role of public-private partnerships in agroforestry adoption: A comparative study. *Journal of Sustainable Agriculture and Environment, 17*(1), 89–105.

Bashir, S., & Iqbal, A. (2023). Tech-based advisory systems and their role in agroforestry adoption among youth farmers. *AgriTech & Extension Journal, 8*(1), 13–29.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Farooq, M., Hussain, M., & Gul, F. (2021). Land tenure and agroforestry adoption in northern Pakistan: An institutional analysis. *Pakistan Journal of Forestry and Natural Resources, 9*(2), 33–45.

Gul, R., Shah, M., & Khan, F. (2021). Gender perspectives in agroforestry: Institutional neglect in KP's rural extension programs. *Journal of Rural Sociology of Pakistan, 7*(3), 134–149.

Hassan, T., & Gul, S. (2021). Participatory models and community monitoring in sustainable agroforestry development. *Community Development Journal of Pakistan, 10*(1), 41–60.

Hernández, R., López, C., & Rojas, J. (2020). Agroforestry in Central America: Long-term impacts on rural income and sustainability. *Latin American Journal of Agricultural Systems, 11*(2), 75–91.

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 7 (August) (2025)

Hussain, A., & Farid, S. (2022). Youth and agroforestry awareness: Integrating climate education in KP schools. *Education and Sustainability Journal, 6*(1), 45–59.

Iqbal, Z., Shah, M., & Tariq, R. (2020). Challenges in agroforestry extension services in Pakistan: A regional analysis. *Pakistan Journal of Agricultural Extension, 22*(4), 290–308.

Jamil, M., & Ullah, A. (2022). NGO-led agroforestry projects and their trust-building outcomes: Evidence from northern KP. *Journal of Nonprofit and Rural Development, 4*(2), 67–81.

Khan, A., & Abbas, N. (2020). Behavioral drivers in agroforestry adoption: Case of KP farmers. *Journal of Applied Behavioral Agriculture, 5*(3), 109–125.

Khan, M. A., & Tariq, M. (2019). Knowledge gaps and advisory failures in Pakistan's agroforestry extension system. *Pakistan Journal of Environmental Policy, 14*(1), 22–39.

Khan, S., Khattak, N., & Shahid, R. (2021). Bureaucratic inefficiencies in rural agroforestry programs: An administrative bottleneck. *Governance and Development Quarterly, 9*(2), 91–107.

Malik, S., Shahbaz, M., & Kundi, S. (2023). Economic returns of agroforestry systems: A case from Himachal Pradesh to northern Pakistan. *Asia-Pacific Journal of Agricultural Economics, 14*(1), 59–77.

Mahmood, S., Bukhari, S., & Ahmed, R. (2022). Institutional role in scaling climate-smart agroforestry in South Asia. *Environmental Sustainability and Policy Review, 11*(4), 77–90.

Niyonsenga, T., Iradukunda, E., & Mugisha, J. (2023). Agroforestry and food security outcomes in Rwanda: A household-level study. *African Journal of Rural Development, 15*(1), 33–50.

Noor, F., & Safdar, M. (2022). Multi-stakeholder collaboration in community-based forestry projects: Lessons from KP. *Pakistani Journal of Participatory Development, 8*(1), 88–104.

Qureshi, T., & Ahmad, R. (2021). Socio-cultural dimensions of agroforestry adoption in Khyber Pakhtunkhwa. *Pakistan Journal of Social Development Studies, 13*(2), 48–66.

Rehman, F., & Shah, S. (2022). Economic shock absorption through agroforestry: Resilience indicators from KP farmers. *Journal of Agricultural Resilience and Sustainability, 10*(3), 210–223.

Rehman, Z., Ali, N., & Murtaza, G. (2020). Agroforestry and ecological sustainability in Pakistan's marginal lands. *Pakistan Journal of Ecology and Rural Management, 12*(4), 145–162.

Saqib, M., & Khan, A. (2022). Financial returns of small-scale agroforestry: Empirical data from Swat Valley. *Agricultural Finance Review of Pakistan, 7*(1), 103–118.

Zada, M., Zada, S., Ali, M., Zhang, Y., Begum, A., Han, H., Ariza Montes, A., & Araya Castillo, L. (2022). Contribution of small-scale agroforestry to local economic development and livelihood resilience: Evidence from Khyber Pakhtunkhwa Province (KPK), Pakistan. *Land, 11*(1), 71.