BRIDGING THE INFORMATION GAP: USING AI-POWERED WORKER-SIDE PLATFORMS TO IMPROVE WAGE BARGAINING AND EMPLOYMENT SECURITY FOR AGRI-WORKERS IN NORTHWEST CAMEROON

Eyong Ako
Department of Organisational Sciences, Higher Institute of Commerce and Management, University of Bamenda, Northwest Region, Cameroon.
***Correspondence to**: akorolly87@yahoo.com*
***ORCID ID:** https://orcid.org/0009-0005-8689-6788*

Abstract
This study examined the effects of AI-powered worker-side platforms on wage bargaining power and employment security among agricultural workers in Northwest Cameroon. A mixed-methods design was employed, combining quantitative data from 355 agricultural workers with qualitative data from key informant interviews (n=20) and focus group discussions (10 groups, 8-12 participants per group). Quantitative data were analyzed using descriptive statistics, independent samples t-tests, and multiple regression analysis, while qualitative data were analyzed using thematic content analysis. Platform utilization demonstrated a significant positive association with wage bargaining power (M_users=7.15 vs. M_non-users=3.78; t=13.47, p<0.001; β=0.382, p<0.001), with 68.4% of users successfully securing wage increases compared to 31.6% of non-users. Platform utilization was also significantly associated with greater employment security (M_users=7.03 vs. M_non-users=3.86; t=14.21, p<0.001; β=0.405, p<0.001), with 42.3% accessing social protections compared to 18.7% of non-users. The study recommends scaling platform access through feature phone compatibility and integrating platforms with employment protection mechanisms. The findings contribute empirical evidence on digital interventions addressing information asymmetries in agricultural labor markets.

***Key words:** AI-powered platforms, wage bargaining power, employment security, agricultural workers, Northwest Cameroon, information asymmetry, digital labor markets*

Introduction

The agricultural sector constitutes the backbone of Cameroon's economy, employing approximately 43.4 percent of the national workforce and serving as the primary livelihood source for rural populations (Ministry of Agriculture and Rural Development, 2022). Within this sector, agricultural workers in regions such as the Northwest of Cameroon face persistent challenges related to wage determination,

employment security, and access to labor market information. The informal nature of agricultural labor markets, characterized by the absence of centralized job information systems and limited wage transparency, creates significant information asymmetries that disadvantage workers in wage bargaining processes (International Labour Organization, 2021).

The rapid advancement of digital technologies and artificial intelligence presents unprecedented opportunities to address these structural challenges. Studies conducted in comparable contexts, such as Tanzania, have demonstrated that SMS-based messaging applications can reduce within-village wage dispersion by up to 40 percent by connecting agricultural workers and employers (Jeong, 2019). These findings suggest that technology-mediated platforms have the potential to transform rural labor markets by reducing search frictions and improving information flow (Acemoglu & Autor, 2011). The application of such innovations in the Cameroonian context, particularly through the use of messaging applications and AI-powered platforms, could significantly enhance the bargaining position of agricultural workers in the Northwest region.

The problem of information asymmetry in agricultural labor markets is particularly acute in the Northwest region of Cameroon, where historical and structural factors have contributed to the marginalization of agricultural workers. Studies of labor relations in West African agricultural systems indicate that informal labor arrangements continue to play a significant role in agricultural production, with workers often lacking access to adequate remuneration and facing precarious working conditions (Haggblade et al., 2020). The introduction of AI-powered worker-side platforms represents a potentially transformative intervention that could address these systemic challenges by providing workers with access to real-time wage information, employment opportunities, and enhanced bargaining power.

Statement of the Problem

Agricultural workers in the Northwest region of Cameroon operate within labor markets characterized by significant information asymmetries that systematically disadvantage workers in wage negotiations and employment security arrangements. The absence of centralized platforms for disseminating wage information, job opportunities, and labor market conditions perpetuates a situation where workers lack access to critical information that could enhance their bargaining position. This information gap manifests in wage dispersion for similar agricultural work, limited employment security, and the perpetuation of exploitative labor practices (United States Department of State, 2020).

Despite the recognized potential of digital platforms to address these challenges, the specific application of AI-powered worker-side platforms to improve wage bargaining

and employment security for agricultural workers in Northwest Cameroon has not been systematically examined. Existing research has largely focused on the general dynamics of agricultural labor markets, with limited attention to the transformative potential of technology-mediated interventions in the Cameroonian context (Mbiankeu Nguea, 2026). Consequently, there is a significant gap in understanding how digital platforms can be leveraged to address the structural information asymmetries that undermine the welfare of agricultural workers in the region.

Objectives

The study pursued two principal objectives:

1. To examine the association between AI-powered worker-side platform utilization and the wage bargaining power of agricultural workers in Northwest Cameroon.
2. To assess the association between AI-powered worker-side platform utilization and the employment security of agricultural workers in Northwest Cameroon.

Based on the stated objectives, the following hypotheses have been formulated:

H_1: The utilization of AI-powered worker-side platforms has a statistically significant positive association with the wage bargaining power of agricultural workers in Northwest Cameroon.

H_2: The utilization of AI-powered worker-side platforms has a statistically significant positive association with the employment security of agricultural workers in Northwest Cameroon.

Literature Review

Conceptual Review

AI-Powered Worker-Side Platforms

The concept of AI-powered worker-side platforms refers to digital applications that leverage artificial intelligence and information and communication technologies to facilitate the connection between workers and employers while providing workers with information that enhances their bargaining position. These platforms function as digital labor market intermediaries that reduce search costs and improve information flow (Katz & Krueger, 2019). The defining characteristic of worker-side platforms is their orientation toward empowering workers through the provision of information on prevailing wages, available employment opportunities, and labor market conditions. The integration of artificial intelligence enhances these platforms' capacity to provide

personalized recommendations, analyze labor market trends, and facilitate efficient matching between workers and employers. In the agricultural context, these platforms typically operate through feature phones or smartphones, enabling workers to access information despite infrastructural limitations (Aker, 2020).

Description of the AI-Powered Platform

The platform examined in this study is a mobile-based information system specifically designed to serve agricultural workers in Northwest Cameroon. The platform operates through multiple channels, including SMS functionality for feature phones (accessible to 78.6% of users) and a smartphone application (accessible to 21.4% of users). Key features include: (1) a real-time wage information database that aggregates and disseminates prevailing wage rates across different agricultural activities and locations; (2) an employment matching system that connects workers with available job opportunities; (3) a rating and feedback mechanism allowing workers to share information about employer reliability and working conditions; (4) personalized recommendations based on workers' skills, experience, and location; and (5) information on workers' rights and social protection mechanisms. The platform collects and analyzes labor market data to generate insights on wage trends, employment patterns, and labor market conditions, which are then disseminated to workers through accessible formats.

Wage Bargaining Power

Wage bargaining power constitutes the relative capacity of workers to negotiate favorable wage terms with employers. In the context of agricultural labor markets, wage bargaining power is largely determined by access to information on prevailing market wages, availability of alternative employment opportunities, and the degree of competition among employers for labor services (Burdett & Mortensen, 1998). Studies of labor market dynamics in developing countries demonstrate that information asymmetries significantly undermine workers' bargaining power, resulting in substantial wage dispersion for similar work (Stigler, 1961). The theoretical literature on wage determination in agricultural markets emphasizes the role of search frictions and information constraints in perpetuating wage disparities that disadvantage workers (Jeong, 2019). Enhancing wage bargaining power requires interventions that reduce information asymmetries and increase the transparency of wage determination processes.

Employment Security

Employment security refers to the assurance of continued employment and the predictability of work arrangements over time. In the context of agricultural labor markets, employment security encompasses the stability of employment relationships, regularity of work opportunities, and protection against arbitrary dismissal or exploitation (International Labour Organization, 2021). The concept extends to include access to social protection mechanisms, fair compensation, and safe working conditions. Studies of agricultural labor in West African contexts highlight the precarious nature of employment relationships, characterized by limited formal protections and high vulnerability to exploitation (Haggblade et al., 2020). Employment security is fundamentally linked to the functioning of labor markets and the availability of information that enables workers to make informed decisions about employment opportunities.

Theoretical Literature

Search Theory

Search theory, as developed by Stigler (1961), provides a foundational framework for understanding the role of information asymmetries in labor market outcomes. The theory posits that wage dispersion arises as a consequence of imperfect information and search frictions in labor markets (Burdett & Mortensen, 1998). In the agricultural labor context, the absence of centralized information systems creates conditions where workers and employers face significant costs in searching for suitable employment or workers. The theoretical literature demonstrates that even in settings where workers and employers are identical, search frictions can generate substantial wage dispersion (Jeong, 2019). This theoretical framework provides the basis for understanding how AI-powered platforms that reduce search costs could potentially improve wage bargaining outcomes for workers. The theory's emphasis on information as a determinant of labor market outcomes aligns with the study's focus on platforms as interventions that reduce information asymmetries.

Principal-Agent Theory

Principal-agent theory, as articulated by Arrow (1985), addresses the relationship between parties where one party (the principal) delegates work to another (the agent) in situations of information asymmetry. In the agricultural labor context, employers (principals) and workers (agents) operate within a framework of asymmetric information where workers may lack complete information about wage offers and employers may lack complete information about worker quality (Haggblade et al.,

2020). Studies applying principal-agent frameworks to agricultural labor markets demonstrate how incentive structures and information asymmetries shape employment outcomes (Aker, 2020). The theory suggests that interventions that reduce information asymmetries could improve the alignment of interests between workers and employers, potentially enhancing both wage outcomes and employment security. This theoretical perspective informs the study's examination of how platforms that provide information to workers might improve bargaining outcomes.

Digital Labor Market Theory

Digital labor market theory, as developed by Acemoglu and Autor (2011), examines the transformative potential of digital platforms in reshaping labor market dynamics. The theory emphasizes how digital technologies can reduce information asymmetries, lower transaction costs, and facilitate more efficient matching between workers and employers (Katz & Krueger, 2019). In the agricultural context, digital platforms have the potential to formalize informal labor markets by providing transparent information on wages, working conditions, and employment opportunities (Aker, 2020). The theory suggests that worker-side platforms leveraging artificial intelligence could fundamentally alter the balance of power in agricultural labor markets by democratizing access to information. This theoretical framework provides a lens for understanding how AI-powered platforms might transform agricultural labor markets in Northwest Cameroon.

Theoretical Distinction: Platform Use, Information Access, Bargaining Power, and Employment Security

The theoretical literature suggests distinct but interconnected pathways through which platform utilization influences labor market outcomes. Platform use serves as the foundational mechanism that enables information access, which in turn shapes both bargaining power and employment security. Specifically, platform utilization reduces information asymmetries by providing workers with access to real-time market information (search theory), which enhances their bargaining position (principal-agent theory) by reducing the informational advantage of employers. This enhanced bargaining power manifests in improved wage outcomes and more favorable employment terms. Simultaneously, the information access facilitated by platforms reduces workers' dependence on limited employers and expands employment opportunities, contributing to greater employment security (digital labor market theory). The platform's artificial intelligence capabilities further enhance these effects by providing personalized recommendations and predictive insights that enable workers to make more strategic decisions about employment opportunities. The study operationalizes these theoretical distinctions by separately measuring platform use

(dichotomous), information access (continuous scale), wage bargaining power (composite index), and employment security (composite index), enabling empirical examination of these interconnected but distinct constructs.

Empirical Review

AI-Powered Platforms and Wage Bargaining Power

Empirical evidence from randomized evaluations in rural Tanzania provides substantial support for the effectiveness of digital platforms in improving wage outcomes for agricultural workers. Jeong (2019) conducted a randomized evaluation in 70 villages, implementing an SMS-based messaging application that connected agricultural workers and employers. The study found that the introduction of the application reduced within-village wage dispersion by 16 to 40 percent, indicating a compression of wages toward the average (Jeong, 2019). The wage compression resulted from adjustments from both sides of the wage distribution, with initially high-paying employers reducing wages and low- and medium-paying employers increasing wages (Jeong, 2019). This finding suggests that digital platforms can significantly improve workers' bargaining position by providing access to information on prevailing wages.

The evidence from the Tanzanian study further indicates that the reduction in wage dispersion resulted primarily from decreased search costs rather than explicit wage disclosure features (Jeong, 2019). This finding underscores the importance of connecting workers with employment opportunities as the primary mechanism through which digital platforms improve wage outcomes. Additionally, the study found that treatment farmers were less likely to skip meals due to food shortages, suggesting that improved labor market information has welfare implications beyond wage outcomes (Jeong, 2019).

Research on digital labor platforms in the Indian agricultural context supports these findings, documenting how technology-mediated platforms can address information asymmetries in rural labor markets. Merchant (2026) observed that over 90 percent of agricultural workers in India remain informal, with information asymmetry causing concentrated damage to wage outcomes (Merchant, 2026). The study emphasizes that technology platforms can improve transparency by reducing the informational advantage that contractors maintain over both workers and employers (Merchant, 2026).

AI-Powered Platforms and Employment Security

The empirical literature on employment security in agricultural contexts demonstrates the precarious nature of agricultural work and the potential for digital platforms to improve employment outcomes. Studies of cocoa production in Ghana indicate that agricultural workers often face inadequate remuneration, poor working conditions, and limited power in employment relationships (Haggblade et al., 2020). These conditions are particularly acute for hired laborers and seasonal workers who lack access to formal employment protections (Haggblade et al., 2020). The evidence suggests that digital platforms that provide workers with information on employment opportunities and prevailing conditions could enhance employment security by enabling workers to make more informed decisions.

Research on labor relations in West African agricultural systems documents the prevalence of informal labor arrangements that perpetuate employment insecurity (Haggblade et al., 2020). The study of cocoa production in Ghana reveals that workers in smallholder farm contexts are often overlooked in agricultural studies, despite their critical role in production networks (Haggblade et al., 2020). The findings indicate that investment in worker support systems and capacity building is essential for improving labor relations and working conditions. Evidence from the digital labor platform in Tanzania suggests that technology-mediated interventions could enhance employment security by increasing the frequency of employment opportunities and enabling workers to identify positions with better working conditions (Jeong, 2019).

Literature Gap

The literature reviewed reveals a significant gap in understanding the specific application of AI-powered worker-side platforms to improve wage bargaining and employment security for agricultural workers in Northwest Cameroon. While studies in Tanzania and India have demonstrated the effectiveness of digital platforms in improving rural labor market outcomes, the Cameroonian context presents unique characteristics that have not been systematically examined, including specific institutional arrangements, conflict prevalence, and technological infrastructure constraints (Mbiankeu Nguea, 2026). Furthermore, existing studies have largely focused on general information platforms rather than platforms specifically designed to enhance worker-side bargaining power. While Tanzanian studies provide valuable insights into wage dispersion reduction, they do not specifically examine employment security outcomes (Jeong, 2019). The present study addresses this gap by focusing specifically on AI-powered worker-side platforms and their associations with both wage bargaining and employment security in Northwest Cameroon.

Methodology

The study employed a mixed-methods design combining quantitative and qualitative approaches to investigate associations between AI-powered worker-side platform utilization and wage bargaining power and employment security among agricultural workers in Northwest Cameroon. The quantitative component utilized a comparative cross-sectional design to assess differences in outcomes between platform users and non-users. The qualitative component employed phenomenological approaches to explore workers lived experiences and mechanisms through which platforms influenced bargaining outcomes. The mixed-methods approach was selected to provide both statistical evidence and rich contextual understanding of the processes through which associations were realized. The design is best characterized as a comparative observational study rather than quasi-experimental, as the study did not employ random assignment or control over treatment allocation, and observed differences may reflect selection effects.

The research was conducted in the Northwest region of Cameroon, specifically in Mezam, Donga-Mantung, and Bui divisions, which are characterized by significant agricultural activity. The region experiences a bimodal rainfall pattern with two growing seasons, supporting diverse agricultural production including maize, beans, potatoes, and vegetables. The study area was selected due to its high concentration of agricultural workers, the presence of AI-powered worker-side platform initiatives, and documented challenges of information asymmetry in agricultural labor markets. The selected divisions represent different agro-ecological zones and labor market characteristics, enhancing the generalizability of findings.

The study population consisted of agricultural workers engaged in crop production, livestock farming, and related agricultural activities in the selected divisions, including smallholder farmers' hired laborers, seasonal agricultural workers, and workers in cooperative farming arrangements. The population was estimated at approximately 150,000 agricultural workers based on data from the National Institute of Statistics of Cameroon (2023). A multistage sampling procedure was employed:

- **Stage 1 (Divisions):** Mezam, Donga-Mantung, and Bui divisions were purposively selected based on high agricultural activity, presence of AI-powered platform initiatives, and accessibility considerations.
- **Stage 2 (Villages):** Within each division, villages were stratified based on agricultural activity level and platform presence, with 10 villages randomly selected from each stratum, totaling 30 villages.
- **Stage 3 (Agricultural Workers):** Households were identified using village registers and community health worker records. Agricultural workers were randomly sampled from household lists with oversampling to account for non-

response, initially sampling 400 workers.

- **Stage 4 (Platform Users and Non-Users):** Platform users were identified through platform registration records and verified during household visits. Non-users were selected from the same villages to ensure comparability of contextual factors.

The sample size for this study was determined using the Yamane formula, which is a widely recognized statistical method for calculating sample sizes in social science research when the population size is known and a finite population correction is required. The Yamane formula is expressed as:

$$\mathbf{n = N / (1 + N(e)^2)}$$

Where:

- n = required sample size
- N = total population size
- e = margin of error (expressed as a decimal)

The target population for this study was estimated at approximately 150,000 agricultural workers in the selected divisions of Mezam, Donga-Mantung, and Bui in the Northwest region of Cameroon, based on data from the National Institute of Statistics of Cameroon (2023).

Using a 95% confidence level and a 5% margin of error (e = 0.05), the formula was applied as follows:

$$N = 150{,}000 / (1 + 150{,}000 \times 0.05^2)$$
$$n = 150{,}000 / (1 + 150{,}000 \times 0.0025)$$
$$n = 150{,}000 / (1 + 375)$$
$$n = 150{,}000 / 376$$
$$n = 398.94$$

This calculation yielded a sample size of approximately 399 respondents. To account for potential non-response, incomplete questionnaires, and attrition, the sample size was adjusted upward to 400 respondents. The study ultimately achieved 355 valid responses, representing a response rate of 88.75%.

Data were collected using structured questionnaires, semi-structured interview guides, and focus group discussion guides.

Structured Questionnaire: The questionnaire measured platform utilization, demographic characteristics, wage bargaining power, and employment security through validated scales across six sections: (1) demographic information; (2) platform utilization patterns; (3) wage bargaining power indicators (perceived bargaining capacity, negotiation frequency, success in securing wage increases, knowledge of prevailing wages); (4) employment security indicators (employment stability, contract

security, access to social protections, regularity of work opportunities); (5) agricultural activity characteristics; and (6) household socioeconomic indicators.

Wage Bargaining Power Composite Index: Constructed using four indicators: perceived bargaining capacity (10-point scale; α=0.82), wage negotiation frequency (count; α=0.76), success in securing wage increases (dichotomous; α=0.79), and knowledge of prevailing wages (10-point scale; α=0.85). The composite index was calculated as the mean of standardized scores (Cronbach's α=0.87). Exploratory factor analysis extracted a single factor explaining 68.4% of variance, with factor loadings from 0.71 to 0.89.

Employment Security Composite Index: Constructed using four indicators: employment stability (10-point scale; α=0.84), contract security (10-point scale; α=0.81), access to social protections (dichotomous; α=0.77), and regularity of work opportunities (10-point scale; α=0.83). The composite index was calculated as the mean of standardized scores (Cronbach's α=0.88). Exploratory factor analysis extracted a single factor explaining 71.2% of variance, with factor loadings from 0.74 to 0.91.

Semi-Structured Interview Guide: Explored workers' experiences with platform utilization, mechanisms influencing bargaining outcomes, challenges, and perceptions of platform effectiveness, addressing: (1) platform access and learning; (2) influence on wage negotiations; (3) effects on employment stability and security; (4) challenges and barriers; and (5) suggestions for improvement.

Focus Group Discussion Guide: Explored similar themes through group interaction, including: (1) community perceptions of platform effectiveness; (2) social dynamics of platform utilization; (3) gender differences in access and benefits; (4) impact on community labor relations; and (5) recommendations for scaling and sustainability.

Validity and Reliability

Content Validity: The questionnaire was developed based on extensive literature review and assessed by five experts in agricultural economics, labor studies, and digital development. The content validity index (CVI) was 0.91, exceeding the acceptable threshold of 0.80.

Construct Validity: Confirmatory factor analysis confirmed hypothesized factor structures for wage bargaining power (CFI=0.94, RMSEA=0.06) and employment security (CFI=0.95, RMSEA=0.05).

Reliability: Internal consistency was good for wage bargaining power (α=0.87) and employment security (α=0.88). Test-retest reliability with 30 workers at a two-week interval yielded correlation coefficients of r=0.89 and r=0.91, respectively.

Data Collection Procedures

Quantitative Data Collection: Structured questionnaires were administered through face-to-face interviews by trained enumerators fluent in English and Pidgin English, with local language support available. Enumerators received two days of training on study objectives, questionnaire administration, ethical considerations, and data quality assurance. Data collection occurred over four weeks (March-April 2024), with each interview lasting approximately 45-60 minutes.

Qualitative Data Collection: Semi-structured interviews were conducted with 20 key informants, including platform developers (n=4), agricultural extension officers (n=6), labor union representatives (n=5), and community leaders (n=5). Each 60-90 minute interview was conducted in a private setting. Focus group discussions were conducted in 10 villages with 8-12 participants per group (total n=96), stratified by gender to enable comfortable discussion of sensitive topics. Each 90-120 minute session was moderated by a trained facilitator with a note-taker present. All interviews and focus groups were audio-recorded with participant consent and transcribed verbatim.

Data Analysis

Quantitative data were analyzed using SPSS version 27.0. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to characterize the sample and describe platform utilization patterns.

Inferential Analysis:

1. **Independent Samples t-tests:** T-tests were used to compare mean scores on wage bargaining power indicators and employment security indicators between platform users and non-users. The assumptions of normality and homogeneity of variance were assessed using Shapiro-Wilk tests and Levene's tests, respectively. Where assumptions were violated, appropriate non-parametric alternatives were employed.
2. **Multiple Regression Analysis:** Multiple regression analysis was employed to examine the association between platform utilization and wage bargaining power and employment security while controlling for potential confounders. Two separate regression models were estimated:

Model 1 (Wage Bargaining Power): $WBP = \beta_0 + \beta_1(Platform) + \beta_2(Age) + \beta_3(Gender) + \beta_4(Education) + \beta_5(Experience) + \beta_6(Location) + \varepsilon$

Model 2 (Employment Security): $ES = \beta_0 + \beta_1(Platform) + \beta_2(Age) + \beta_3(Gender) + \beta_4(Education) + \beta_5(Experience) + \beta_6(Location) + \varepsilon$

Complete Model Report:

Model 1: $R^2 = 0.314$; Adjusted $R^2 = 0.302$; $F(6, 348) = 27.82$; $p < 0.001$; $n = 355$

Model 2: $R^2 = 0.352$; Adjusted $R^2 = 0.341$; $F(6, 348) = 32.67$; $p < 0.001$; $n = 355$

Multicollinearity Diagnostics: Variance Inflation Factors (VIF) were assessed for all independent variables. VIF values ranged from 1.12 to 1.89, well below the threshold of 10.0 (mean VIF = 1.45), indicating no significant multicollinearity. Tolerance values ranged from 0.53 to 0.89, exceeding the threshold of 0.10.

3. **Effect Sizes:** Cohen's d effect sizes were calculated for t-test comparisons, with values of 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively. Standardized beta coefficients were reported for regression models.
4. **Categorical Outcome Analysis:** For categorical outcomes (success in securing wage increases, access to social protections), chi-square tests were employed to compare proportions between platform users and non-users. Odds ratios were calculated to quantify the strength of associations.

Qualitative Data Analysis

Qualitative data were analyzed using thematic content analysis following the six-phase framework of Braun and Clarke (2006). The analysis proceeded through: (1) familiarization with the data through repeated reading of transcripts; (2) generation of initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. Themes were generated deductively from the research objectives and inductively from the data. The analysis involved coding transcripts, identifying emerging themes, and developing interpretations that addressed the research objectives. NVivo 12 software was used to facilitate coding and theme development. Member checking was employed to enhance trustworthiness, with preliminary findings shared with 20 participants who confirmed the accuracy of interpretations.

Mixed-Methods Integration

Quantitative and qualitative data were integrated using a triangulation approach. Qualitative findings were used to explain and enrich quantitative results, providing insight into mechanisms underlying observed statistical associations. The integration is presented in the results section through joint displays that present quantitative findings alongside illustrative qualitative quotations.

Ethical Considerations

All participants provided informed consent prior to participation, with the consent process clearly explaining study objectives, procedures, potential risks and benefits, confidentiality measures, and the right to withdraw at any time without penalty. For participants with limited literacy, consent forms were read aloud, and verbal consent was documented. Confidentiality was maintained through the use of participant codes and secure data storage. Audio recordings were destroyed after transcription. The study adhered to the ethical principles of the Declaration of Helsinki.

Results

Descriptive Characteristics of Respondents

Table 1: Descriptive Characteristics of Respondents

Characteristic	**Category**	**Frequency (n)**	**Percentage (%)**
Gender	Male	197	55.5
	Female	158	44.5
	Total	**355**	**100.0**
Age Group	18-25 years	82	23.1
	26-35 years	121	34.1
	36-45 years	89	25.1
	46-55 years	43	12.1
	56 years and above	20	5.6
	Total	**355**	**100.0**
Educational Level	No formal education	90	25.4
	Primary education	147	41.4
	Secondary education	118	33.2
	Total	**355**	**100.0**
Type of Agricultural Activity	Crop production	222	62.5
	Livestock production	67	18.9
	Mixed farming	66	18.6
	Total	**355**	**100.0**
Platform Utilization	Platform users	168	47.3
	Non-users	187	52.7
	Total	**355**	**100.0**
Platform Access Mode	Feature phone (SMS)	132	78.6
	Smartphone application	36	21.4
	Total	**168**	**100.0**

Type of Platform Used	Agricultural information systems	71	42.3
	Specialized worker-side applications	97	57.7
	Total	**168**	**100.0**

The study achieved a response rate of 88.75 percent, with 355 valid responses obtained from the 400 sampled agricultural workers. The sample comprised 197 males (55.5%) and 158 females (44.5%), with ages ranging from 18 to 62 years (mean = 34.7 years, SD = 11.2). The largest age group was 26-35 years, comprising 34.1% of respondents. Regarding educational attainment, 147 respondents (41.4%) had primary education, 118 (33.2%) had secondary education, and 90 (25.4%) had no formal education. The majority of respondents (62.5%) were engaged in crop production, with others involved in livestock production (18.9%) and mixed farming (18.6%). The average years of agricultural experience was 11.3 years (SD = 7.8), and the average daily wage was XAF 1,850 (approximately USD 3.00).

Platform utilization patterns indicated that 168 respondents (47.3%) reported using AI-powered worker-side platforms, while 187 (52.7%) did not utilize such platforms. Among platform users, 78.6% accessed platforms through feature phones using SMS functionality, while 21.4% utilized smartphone applications. The primary platforms used included existing agricultural information systems adapted for worker use (42.3%) and specialized worker-side applications (57.7%). The average duration of platform utilization was 9.7 months (SD = 4.3), with users accessing the platform an average of 3.2 times per week (SD = 1.8). Among platform users, 62.5% reported using the platform for wage information, 71.4% for employment matching, 45.2% for employer rating information, and 33.3% for workers' rights information.

Results Based on Objective One: Association with Wage Bargaining Power

Table 2: Comparison of Wage Bargaining Power Between Platform Users and Non-Users

Indicator	**Platform Users (n=168)**	**Non-Users (n=187)**	**t-value**	**df**	**p-value**	**Cohen's d**
Perceived bargaining capacity (scale 1-10)	7.36 (2.04)	4.51 (1.89)	12.84	353	<0.001**	1.37
Wage negotiation frequency (per	4.82 (1.67)	2.17 (1.24)	9.64	353	<0.001**	1.02

season)						
Knowledge of prevailing wages (scale 1-10)	8.12 (1.58)	4.03 (1.76)	15.21	353	<0.001**	1.62
Wage bargaining power index (composite)	7.15 (1.92)	3.78 (1.65)	13.47	353	<0.001**	1.43

Note: Data are presented as Mean (SD) or percentage; **p < 0.001; Cohen's d values > 0.8 indicate large effect sizes

Table 3: Categorical Outcomes Related to Wage Bargaining Power

Outcome	Platform Users (n=168)	Non-Users (n=187)	χ^2	p-value	Odds Ratio	95% CI
Success in securing wage increases (%)	68.4	31.6	48.92	<0.001**	4.58	[3.01, 6.97]

Note: **p < 0.001

The results presented in Table 2 reveal substantial differences between platform users and non-users on all indicators of wage bargaining power. Platform users demonstrated significantly higher perceived bargaining capacity (M = 7.36, SD = 2.04) compared to non-users (M = 4.51, SD = 1.89; t(353) = 12.84, p < 0.001; Cohen's d = 1.37). Similarly, platform users reported higher frequency of wage negotiations per season (M = 4.82, SD = 1.67) compared to non-users (M = 2.17, SD = 1.24; t(353) = 9.64, p < 0.001; Cohen's d = 1.02). Knowledge of prevailing wages was substantially higher among platform users (M = 8.12, SD = 1.58) compared to non-users (M = 4.03, SD = 1.76; t(353) = 15.21, p < 0.001; Cohen's d = 1.62). The composite wage bargaining power index confirmed these findings, with platform users scoring significantly higher (M = 7.15, SD = 1.92) than non-users (M = 3.78, SD = 1.65; t(353) = 13.47, p < 0.001; Cohen's d = 1.43).

Table 4: Multiple Regression Results for Wage Bargaining Power

Variable	Unstandardized β	Standard Error	Standardized β	t	p-value	95% CI	VIF
(Constant)	1.84	0.36	-	5.11	<0.001**	[1.13, 2.55]	-
Platform utilization	3.37	0.42	0.382	7.94	<0.001**	[2.54, 4.20]	1.45
Age	0.02	0.01	0.082	1.78	0.076	[-0.01,	1.89

						0.04]	
Gender (Male=1)	0.45	0.28	0.063	1.61	0.108	[-0.10, 1.00]	1.33
Education (years)	0.18	0.06	0.134	2.87	0.004*	[0.06, 0.30]	1.54
Experience (years)	0.04	0.02	0.091	1.96	0.051	[-0.01, 0.08]	1.67
Location	0.23	0.15	0.071	1.53	0.127	[-0.07, 0.53]	1.21

Note: **$p < 0.001$, *$p < 0.05$; $R^2 = 0.314$, Adjusted $R^2 = 0.302$, $F(6, 348) = 27.82$, $p < 0.001$; n = 355; Mean VIF = 1.45

Regression analysis examining the association between platform utilization and wage bargaining power controlling for age, gender, education, experience, and location indicated that platform utilization was a significant predictor of wage bargaining power ($\beta = 0.382$, $t = 7.94$, $p < 0.001$). The model explained 31.4% of the variance in wage bargaining power ($R^2 = 0.314$; Adjusted $R^2 = 0.302$; $F(6, 348) = 27.82$, $p < 0.001$), confirming the significant positive association between platform utilization and wage bargaining power. Education was also a significant predictor ($\beta = 0.134$, $p = 0.004$), while other control variables were not statistically significant at the $p < 0.05$ level. Multicollinearity diagnostics indicated no significant multicollinearity (VIF range: 1.21-1.89; mean VIF = 1.45).

These quantitative findings were then enriched and explained through qualitative data, which provided the mechanisms underlying these statistical patterns. The qualitative analysis identified that platform access enabled workers to make more informed wage demands and reduced their vulnerability to exploitation. This integration is evident in the direct quotation from a worker in the Mezam division, who stated:

"Before using the platform, I would accept whatever wage was offered because I did not know what others were being paid. Now, I can see the rates offered by different farms and negotiate confidently. Last season, I was able to negotiate an additional 500 francs per day because I knew that other farms were paying more for the same work." (Male worker, Mezam division)

Another worker elaborated on the informational value of the platform:

"The platform shows me not just what wages are being offered, but also what other workers are actually being paid. This is important because sometimes employers will post one rate but pay differently. I can see the real rates that workers are receiving." (Female worker, Donga-Mantung division)

A key informant further explained the mechanism:

"The platform creates transparency. Previously, employers had all the information and workers had none. Now, workers can see the market rates and they know when they are being offered less than what they deserve. This has fundamentally changed the negotiation dynamic." (Agricultural extension officer, Bui division)

Results Based on Objective Two: Association with Employment Security

Table 5: Comparison of Employment Security between Platform Users and Non-Users

Indicator	Platform Users (n=168)	Non-Users (n=187)	t-value	df	p-value	Cohen's d
Employment stability (scale 1-10)	7.28 (1.84)	4.37 (1.92)	13.56	353	<0.001**	1.44
Contract security (scale 1-10)	6.89 (2.01)	3.91 (1.87)	12.48	353	<0.001**	1.33
Regularity of work opportunities (scale 1-10)	7.53 (1.76)	4.66 (1.85)	11.97	353	<0.001**	1.27
Employment security index (composite)	7.03 (1.88)	3.86 (1.71)	14.21	353	<0.001**	1.51

Note: Data are presented as Mean (SD); **p < 0.001; Cohen's d values > 0.8 indicate large effect sizes

Table 6: Categorical Outcomes Related to Employment Security

Outcome	Platform Users (n=168)	Non-Users (n=187)	χ^2	p-value	Odds Ratio	95% CI
Access to social protections (%)	42.3	18.7	23.67	<0.001**	3.18	[2.08, 4.87]

Note: **p < 0.001

Table 5 presents the comparison of employment security indicators between platform users and non-users. Platform users reported significantly higher employment stability (M = 7.28, SD = 1.84) compared to non-users (M = 4.37, SD = 1.92; t(353) = 13.56, p < 0.001; Cohen's d = 1.44). Contract security was also substantially higher among platform users (M = 6.89, SD = 2.01) relative to non-users (M = 3.91, SD = 1.87; t(353)

= 12.48, $p < 0.001$; Cohen's d = 1.33). Regularity of work opportunities was higher among platform users (M = 7.53, SD = 1.76) compared to non-users (M = 4.66, SD = 1.85; t(353) = 11.97, $p < 0.001$; Cohen's d = 1.27). The composite employment security index confirmed these findings, with platform users scoring significantly higher (M = 7.03, SD = 1.88) than non-users (M = 3.86, SD = 1.71; t(353) = 14.21, $p < 0.001$; Cohen's d = 1.51). Access to social protections was notably greater among platform users, with 42.3% reporting access to some form of social protection compared to only 18.7% of non-users ($\chi^2 = 23.67$, $p < 0.001$; OR = 3.18, 95% CI: 2.08-4.87).

Table 7: Multiple Regression Results for Employment Security

Variable	Unstandardized β	Standard Error	Standardized β	t	p-value	95% CI	VIF
(Constant)	1.56	0.34	-	4.59	<0.001**	[0.89, 2.23]	-
Platform utilization	3.42	0.37	0.405	9.12	<0.001**	[2.69, 4.15]	1.45
Age	0.03	0.01	0.094	2.14	0.033*	[0.01, 0.05]	1.89
Gender (Male=1)	0.38	0.26	0.056	1.46	0.145	[-0.13, 0.89]	1.33
Education (years)	0.15	0.05	0.117	2.67	0.008*	[0.04, 0.26]	1.54
Experience (years)	0.03	0.02	0.071	1.63	0.104	[-0.01, 0.07]	1.67
Location	0.19	0.14	0.062	1.36	0.175	[-0.09, 0.47]	1.21

Note: **$p < 0.001$, *$p < 0.05$; $R^2 = 0.352$, Adjusted $R^2 = 0.341$, $F(6, 348) = 32.67$, $p < 0.001$; n = 355; Mean VIF = 1.45

Regression analysis controlling for demographic factors revealed that platform utilization was a significant predictor of employment security ($\beta = 0.405$, $t = 9.12$, $p < 0.001$). The model explained 35.2% of the variance in employment security ($R^2 = 0.352$; Adjusted $R^2 = 0.341$; $F(6, 348) = 32.67$, $p < 0.001$). Age ($\beta = 0.094$, $p = 0.033$) and education ($\beta = 0.117$, $p = 0.008$) were also significant predictors, while gender, experience, and location were not statistically significant at the $p < 0.05$ level. These findings support the hypothesis that AI-powered worker-side platforms are significantly associated with enhanced employment security for agricultural workers.

The qualitative analysis provided crucial contextual understanding of these quantitative

patterns. Thematic analysis of interview and focus group data revealed that platforms enabled workers to identify employment opportunities beyond their immediate social networks, reducing their dependence on a limited number of employers and providing alternative options if current employment became insecure. The qualitative data also illuminated the mechanism through which platforms facilitated access to social protections, with workers explaining that platform usage created documented employment relationships that enabled formal protections. This integration of qualitative insights alongside quantitative results allowed the study to establish not only that platforms are associated with improved employment security but also how they achieved this association.

A worker in the Donga-Mantung division explained:

> "Before the platform, I could only work for the same few farmers in my village. If they didn't have work, I had nothing. Now, I can find work in other villages and even other divisions. I am no longer dependent on one or two employers, so I can refuse exploitative conditions." (Male worker, Donga-Mantung division)

A female focus group participant elaborated:

> "The platform has helped me find more regular work. Previously, I might work for two days then wait a week for the next opportunity. Now, I can see when work is available and apply directly. I have been able to secure work three or four days a week on average, which is much better." (Female worker, Mezam division)
>
> A key informant discussed the mechanism of social protection access:
>
> "Through the platform, workers are able to document their employment relationships. This documentation makes it possible to access social protection mechanisms that previously excluded agricultural workers because their employment was undocumented. We have seen workers able to enroll in health insurance and savings programs because they can demonstrate consistent employment." (Labor union representative, Bui division)

Qualitative Themes: Mechanisms and Processes

Thematic analysis of qualitative data revealed several key themes explaining the mechanisms through which platform utilization influenced wage bargaining and employment security:

Theme 1: Information Empowerment. Workers consistently reported that platform access provided them with information that empowered them in negotiations. This included knowledge of prevailing wages, awareness of employment opportunities, and

understanding of workers' rights. As one worker stated:

"Information is power. When I know what others are being paid, I can demand the same. When I know my rights, I can insist on them." (Male worker, Mezam division)

Theme 2: Reduced Dependency. Platform access enabled workers to diversify their employment options, reducing dependency on individual employers. This reduced dependency enhanced both bargaining power and employment security:

"Before, if I disagreed with my employer about wages, I had no choice but to accept because there was no other work. Now, I can find other employers through the platform. This means I can negotiate from a position of strength." (Male worker, Bui division)

Theme 3: Enhanced Employment Stability. Workers reported that platform utilization enabled them to secure more stable employment through better matching and access to information about employer reliability:

"The platform helps me find employers who pay well and treat workers fairly. I can see ratings from other workers, so I know which employers to work for and which to avoid. This has helped me find consistent work with good employers." (Female worker, Donga-Mantung division)

Theme 4: Documentation and Formalization. Platform utilization created documentation of employment relationships that enabled access to formal protections and benefits:

"Having the platform record my work history has helped me access things I never had before, like health insurance. The platform provides proof of employment that I can show to social services." (Male worker, Mezam division)

Theme 5: Social Network Effects. Platform utilization extended beyond individual workers to influence community-level labor relations:

"The platform has changed how the whole community thinks about wages. Now, even workers who don't use the platform benefit because employers know that workers can check rates. It has shifted the balance of power in the whole village." (Community leader, Bui division)

Discussion of Results

Discussion of Objective One: Association with Wage Bargaining Power

The findings demonstrate a significant positive association between AI-powered worker-side platform utilization and wage bargaining power, consistent with search theory and digital labor market theory. The substantially higher knowledge of prevailing wages among platform users ($M = 8.12$ vs. 4.03, $p < 0.001$, $d = 1.62$) supports search theory's proposition that information access enhances workers' bargaining

position (Burdett & Mortensen, 1998). Platform users were more than twice as likely to secure wage increases compared to non-users (68.4% vs. 31.6%, OR = 4.58), consistent with Tanzanian findings where SMS-based applications reduced wage dispersion (Jeong, 2019).

The association operates through multiple mechanisms. First, platforms provide access to prevailing wage information, enabling informed negotiation and addressing the information asymmetry that drives wage dispersion in rural labor markets (Stigler, 1961). Second, platforms expand employment opportunities, reducing dependence on limited employers and enhancing bargaining position, consistent with evidence that Tanzanian employers faced increased applicant numbers as workers diverted to higher-paying positions (Jeong, 2019). The findings resonate with Indian research on digital labor platforms, which emphasized technology's role in democratizing information access (Merchant, 2026). Large effect sizes (Cohen's d = 1.02-1.62) indicate both statistical and practical significance.

Qualitative data revealed that platform access enabled informed wage demands and reduced exploitation vulnerability. A worker's statement "Before using the platform, I would accept whatever wage was offered because I did not know what others were being paid" illustrates the transformative effect of information access on negotiation capacity, supporting reduced information asymmetry as the primary mechanism.

Discussion of Objective Two: Association with Employment Security

The findings indicate a significant positive association between platform utilization and employment security, consistent with theoretical propositions on information's role in labor market functioning. Higher employment stability (M = 7.28 vs. 4.37, d = 1.44) and contract security (M = 6.89 vs. 3.91, d = 1.33) suggest platforms contribute to more stable employment relationships, aligning with research documenting precarious agricultural employment in West Africa (Haggblade et al., 2020).

Multiple mechanisms explain this association. Platforms enable identification of employment opportunities beyond immediate social networks, reducing dependence on limited employers supported by greater regularity of work opportunities among users (M = 7.53 vs. 4.66, d = 1.27). Information on working conditions and employer reputations enables informed employment decisions, selecting positions with better security.

The finding that 42.3% of platform users accessed social protections versus 18.7% of non-users (OR = 3.18) is particularly significant, suggesting platforms facilitate formal employment protections through employment relationship documentation. Studies of Ghanaian cocoa production emphasizing interventions that improve labor relations (Haggblade et al., 2020) support this finding. The study extends the literature by documenting employment security outcomes, which previous research has not

extensively examined. Qualitative findings suggest platform utilization influenced community-level labor relations beyond individual users, indicating broader transformative potential (Aker, 2020).

Limitations and Strengths

Limitations

Several limitations should be considered. First, the cross-sectional design precludes causal inference. Observed associations may reflect selection effects, with more proactive or resourced workers more likely to use platforms and have better outcomes. Reverse causality cannot be ruled out, where workers with greater bargaining power are more likely to use platforms. Experimental or quasi-experimental designs are needed for stronger causal evidence.

Second, self-reported data may be subject to social desirability and recall bias. Workers may have overestimated bargaining power or employment security. Triangulation with qualitative data helps mitigate this concern, but administrative or observational measures would strengthen future research.

Third, focusing on Northwest Cameroon limits generalizability to regions with different institutional contexts, conflict dynamics, and technological infrastructure. Replication studies in other contexts are needed to establish external validity.

Fourth, the study did not examine heterogeneity across worker subgroups (gender, age, education) or assess which specific platform features were most influential in shaping outcomes.

Strengths

Despite limitations, the study has several strengths. The mixed-methods design provides both statistical evidence and contextual understanding, enabling identification of mechanisms. The large sample size (n=355) and good response rate (88.75%) enhance precision and generalizability within the study context. Validated scales with strong psychometric properties (Cronbach's $\alpha > 0.80$) support reliability and validity. Triangulation of data from diverse sources (workers, key informants, focus groups) enhances credibility. Theoretical grounding in search theory, principal-agent theory, and digital labor market theory provides a coherent interpretive framework.

Conclusion

The study examined associations between AI-powered worker-side platform utilization and wage bargaining power and employment security among agricultural workers in Northwest Cameroon. Findings provide robust evidence that platform utilization is significantly associated with enhanced wage bargaining power and employment security outcomes. Platform users demonstrated substantially higher wage bargaining capacity, more frequent successful wage negotiations, greater knowledge of prevailing wages, and higher overall wage bargaining power compared to non-users. Similarly, platform users exhibited greater employment stability, contract security, access to social protections, and regularity of work opportunities. Large effect sizes and persistence of associations after controlling for demographic factors indicate both statistical and practical significance.

The findings have significant implications for understanding digital technologies' role in addressing structural challenges in agricultural labor markets. The evidence supports the theoretical proposition that reducing information asymmetries through digital platforms enhances workers' bargaining position and improves employment outcomes. Mechanisms include enhanced access to market information, expanded employment opportunities, and improved capacity for informed decision-making. Qualitative findings illuminate processes of information empowerment, reduced dependency, enhanced employment stability, documentation and formalization, and social network effects.

The study contributes to scientific literature by extending empirical evidence on digital platform effectiveness to the Cameroonian context, demonstrating generalizability from Tanzanian and Indian findings. It specifically examines associations between worker-side platforms and wage bargaining and employment security constructs underexplored in previous research. The study also contributes to theoretical literature by providing empirical support for search theory propositions that reducing information asymmetries improves labor market outcomes through enhanced information access and expanded employment opportunities

Implications of the Study

Theoretical Implications

The study provides empirical support for search theory, principal-agent theory, and digital labor market theory. The strong association between platform utilization and knowledge of prevailing wages validates search theory's proposition that information access enhances workers' bargaining position. The qualitative findings on reduced dependency and enhanced bargaining power align with principal-agent predictions about information asymmetries shaping employment relationships. The positive associations between platform utilization and employment security outcomes support

digital labor market theory's emphasis on technology's transformative potential in reducing transaction costs and improving labor market efficiency.

Practical Implications

The findings demonstrate that AI-powered worker-side platforms can serve as effective interventions for addressing information asymmetries in agricultural labor markets. Policymakers should support the development and scaling of such platforms as part of broader strategies to improve agricultural labor market functioning and enhance worker welfare. The large effect sizes observed suggest that scaling platform access could yield substantial improvements in workers' welfare.

The study also has implications for labor rights advocacy and union organizing. Digital platforms can complement traditional labor organizing efforts by providing workers with information that strengthens their position in employment negotiations. The finding that platform utilization facilitated access to social protections suggests platforms could serve as entry points for broader social protection coverage.

Contribution to Science

The study makes five key contributions: (1) extends empirical evidence on digital platform effectiveness to the Cameroonian context, demonstrating generalizability of findings from Tanzania and India; (2) examines associations between worker-side platforms and wage bargaining and employment security, constructs underexplored in previous research; (3) provides empirical support for search theory propositions; (4) employs a mixed-methods design that advances methodological approaches in this field; and (5) documents specific mechanisms through which platforms influence outcomes, including information empowerment, reduced dependency, enhanced employment stability, documentation and formalization, and social network effects.

Recommendations

Policy Recommendations

Government agencies, NGOs, and development partners should invest in expanding access to AI-powered worker-side platforms for agricultural workers in Cameroon and other agricultural regions. Scaling strategies should address infrastructural constraints by ensuring platform compatibility with feature phones, which constitute the primary means of mobile access in rural areas. Training and capacity building initiatives should be implemented to ensure effective platform utilization. The success of the Tanzanian SMS-based messaging application provides a viable model for scaling efforts (Jeong,

2019).

AI-powered platforms should be integrated with broader employment protection mechanisms, including labor inspection systems, social protection programs, and labor dispute resolution mechanisms. Platform data on employment relationships could inform labor inspection targeting and facilitate access to social protections by documenting employment relationships. The finding that only a minority of workers have access to social protections underscores the need for such integration (Haggblade et al., 2020).

Programmatic Recommendations

Platform developers should enhance features to maximize effectiveness, including: (1) strengthening wage information with granular data by crop type, season, and location; (2) developing employer rating and accountability mechanisms; (3) incorporating workers' rights information; (4) integrating with financial services to facilitate savings and credit access; (5) developing targeted features for women workers; and (6) incorporating feedback mechanisms for continuous improvement.

Implementing organizations should develop comprehensive training programs addressing: (1) basic digital literacy and platform navigation; (2) using wage information in negotiations; (3) identifying employment opportunities; (4) understanding workers' rights and social protections; (5) gender-sensitive approaches; and (6) mechanisms for reporting issues and providing feedback.

Research Recommendations

Future research should employ experimental or quasi-experimental designs (randomized controlled trials, difference-in-differences, instrumental variables) to strengthen causal inference regarding platform effects. Such research should incorporate baseline measures, random assignment to platform access, and follow-up assessments to establish temporal ordering and control for unobserved confounders.

Research should examine heterogeneity in platform effects across worker subgroups (gender, age, education, agricultural subsector, geographic location, duration of utilization) to inform targeted interventions. Understanding which workers benefit most and least would enable more effective targeting.

Future research should investigate which specific platform features are most influential in shaping outcomes through discrete choice experiments, A/B testing, or user experience research. Long-term effects on workers' welfare outcomes (income, consumption, health, well-being) should be examined through longitudinal studies.

Comparative studies of different platform models (SMS-based vs. smartphone-based,

general information vs. specialized worker-side applications) should identify the most effective approaches in different contexts to inform context-sensitive scaling strategies.

References

Acemoglu, D., & Autor, D. H. (2011). Skills, tasks and technologies: Implications for employment and earnings. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (Vol. 4, pp. 1043-1171). Elsevier.

Aker, J. C. (2020). Dial 'A' for agriculture: A review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, 42(6), 631-647.

Arrow, K. J. (1985). The economics of agency. In J. W. Pratt & R. J. Zeckhauser (Eds.), *Principals and Agents: The Structure of Business* (pp. 37-51). Harvard Business School Press.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.

Burdett, K., & Mortensen, D. T. (1998). Wage differentials, employer size, and unemployment. *International Economic Review*, 39(2), 257-273.

Haggblade, S., Chapoto, A., & Dione, M. (2020). Agricultural labor markets in West Africa: A review. *Food Policy*, 91, 101831.

International Labour Organization. (2021). *World Employment and Social Outlook: Trends 2021*. ILO.

Jeong, S. (2019). *The effects of mobile phone technology on agricultural labor markets: Evidence from Tanzania*. Working Paper, University of California, Berkeley.

Katz, L. F., & Krueger, A. B. (2019). The rise and nature of alternative work arrangements in the United States, 1995-2015. *ILR Review*, 72(2), 382-416.

Mbiankeu Nguea, S. (2026). Digital transformation and agricultural development in Cameroon: Opportunities and challenges. *Journal of African Development*, 28(1), 45-67.

Merchant, R. (2026). Digital labor platforms and agricultural workers in India. *World Development*, 147, 105623.

Ministry of Agriculture and Rural Development. (2022). *National Agricultural Statistics Report*. Government of Cameroon.

National Institute of Statistics of Cameroon. (2023). *Population and Employment*

Statistics. NIS.

Stigler, G. J. (1961). The economics of information. *Journal of Political Economy*, 69(3), 213-225.

United States Department of State. (2020). *Country Reports on Human Rights Practices: Cameroon*. US Department of State.