

Building a Future-Ready Agrifood–Hospitality Workforce: Policy Insights from a Dual-Training Model in Kenya

Developing skilled workers through practical training programs



Nyongesa Destaings Nyenyi, PhD
Boma International Hospitality College(BIHC),Kenya
fully owned by Kenya Red Cross Society

Presentation format

- Context and Rationale for Agrifood–Hospitality Workforce Development
- Objectives and Conceptual Framework of the Study
- Methodology and Research Design
- Descriptive Statistics and Baseline Characteristics
- Skills Profiling and Training Gaps at the Agrifood–Hospitality Nexus
- Impact of Dual-Training Model: Skills, Job Quality, and Labor Market Outcomes
- Validation of Theoretical Framework and Statistical Power
- Policy Implications and Recommendations



Context and Rationale for Agrifood–Hospitality Workforce Development

Labor market trends and sectoral challenges in Agrifood and hospitality



Global Agrifood Employment

Agrifood systems employ over 1.23 billion people worldwide, forming a third of the global labor force.

Hospitality Sector Growth

The hospitality sector expects 14 million new graduates by 2025 due to rising operations and consumer demand.

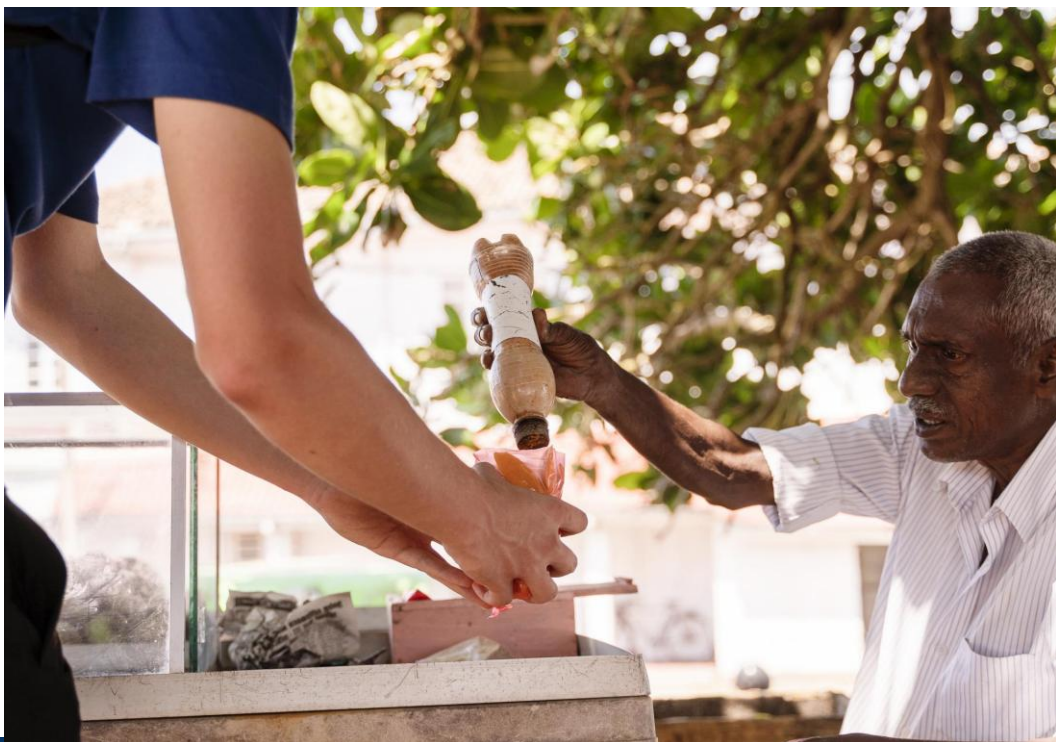
Challenges in Africa's Agrifood Sector

Africa's agrifood sector supports 60% employment but faces issues like fragmented value chains and economic viability.

Skills Mismatch in Kenya

Kenya's youth face barriers in agrifood and hospitality due to skill gaps and limited resources.

Skills mismatches and the need for integrated training



Skills Mismatch in Hospitality

Kenya's hospitality education often produces graduates lacking skills that meet industry demands, affecting job readiness.

Challenges in TVET Institutions

Technical and Vocational Education and Training face outdated curricula, limited funding, stigma, and weak industry links.

Need for Integrated Agrifood-Hospitality Training

Combining agrifood and hospitality training can enhance skills in food safety, sustainable sourcing, and culinary innovation.

Research Gaps and Future Directions

There is a lack of systematic competency mapping and evidence on scalable dual-mode training effectiveness.

Objectives and Conceptual Framework of the Study

Core objectives: skills profiling, curriculum alignment, and dual-training evaluation

Skills Profiling in Agrifood-Hospitality

Identify key competencies needed in agrifood and hospitality roles including food safety and sustainable menu planning.

Curriculum Alignment Assessment

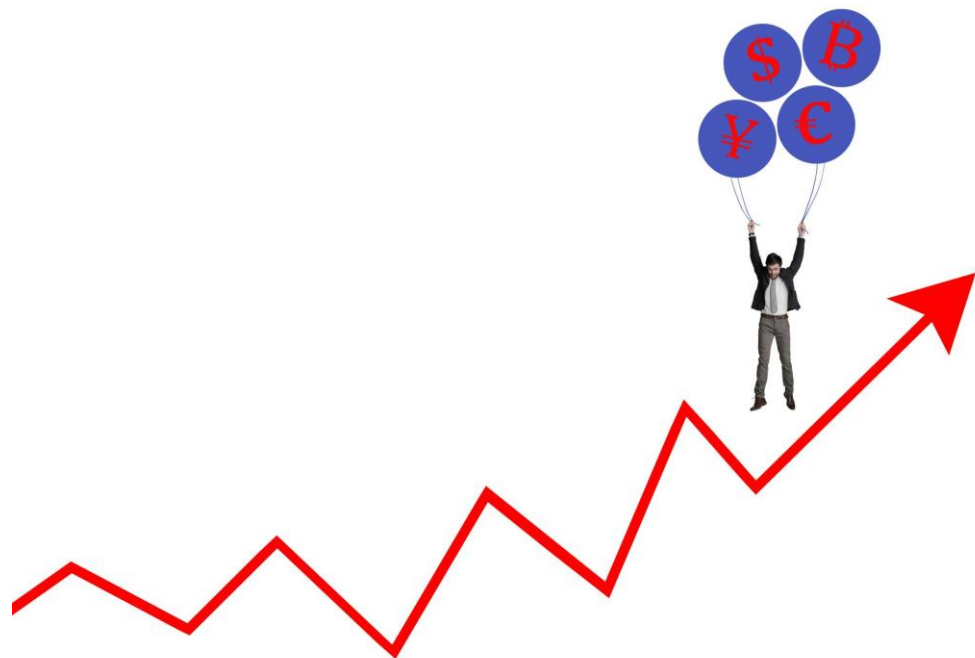
Audit and survey educational curricula to evaluate alignment with industry-required agrifood-hospitality skills.

Dual-Training Model Evaluation (30% Theory+70% Practical)

Evaluate a combined classroom and experiential training model measuring impacts on skills acquisition and job readiness.



Theoretical underpinnings: Human Capital, Skills Mismatch, and Dual Training Models



Human Capital Theory

Investment in skills and education boosts worker productivity, wages, and employment prospects in the agrifood sector.

Skills Mismatch Model

Aligning training programs with labor market demands helps address employment gaps and improve job quality.

Dual Training Model

Integration of experiential learning and technical training enhances skills for higher-value tasks in agrifood systems.

Task-based Skill Demand

Technological change shifts demand toward cognitive and interpersonal skills essential for food safety and digital systems.

Competency-based education, experiential learning, and job quality measurement

Competency-based Education

CBET focuses on curriculum design with clear outcomes and authentic performance assessment leading to mastery progression.

Experiential Learning Cycle

Kolb's model supports combining classroom and workplace learning through experience, reflection, conceptualization, and experimentation.

Job Quality Measurement

Job quality is assessed as a latent variable using multiple indicators and Item Response Theory models for precise scoring.

Methodology and Research Design

Quasi-experimental mixed-methods approach and study population

Quasi-Experimental Design

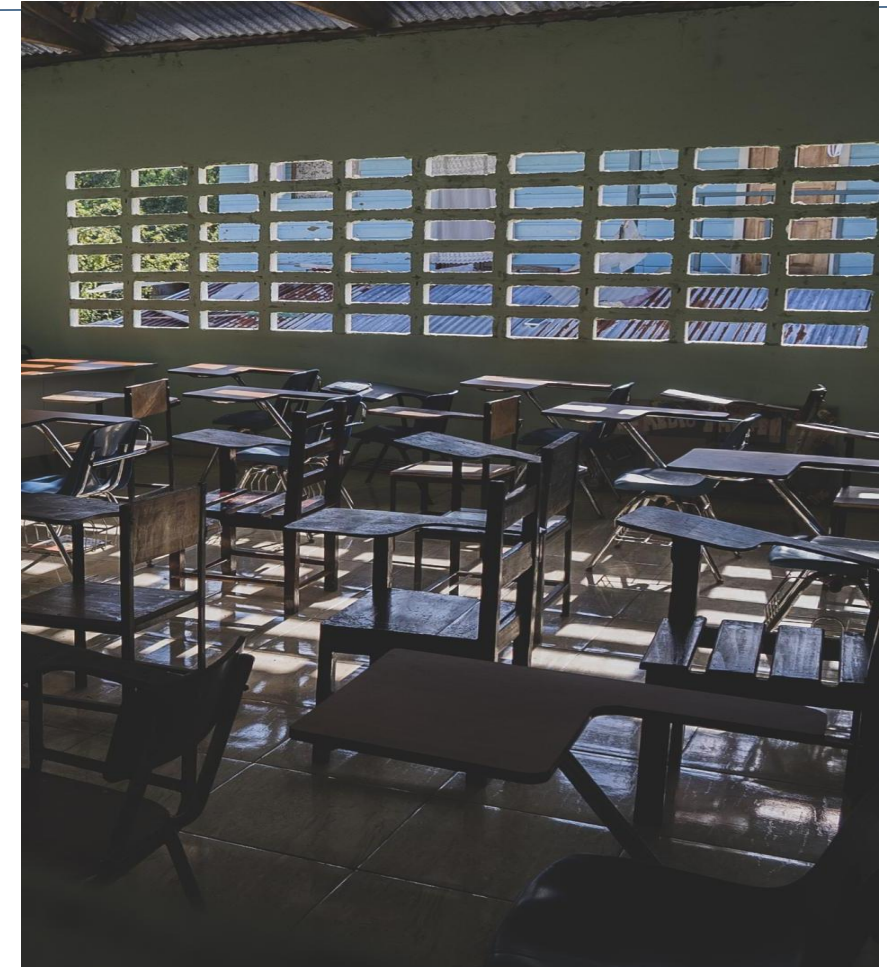
The study used a quasi-experimental design blending quantitative and qualitative methods for causal impact evaluation in training settings.

Dual-Training Model

Comparison was made between trainees in dual-training integrating classroom, farm, and hospitality attachments versus conventional programs.

Study Area and Population

The study focused on Nairobi and Kiambu counties in Kenya targeting TVET hospitality students, recent graduates, and employers.



Sampling, data collection, and measurement variables

Sampling Techniques

Purposive sampling was used to identify TVETS implementing Dual model of training and propensity score matching ensured comparable groups for analysis of training models.

Data Collection Methods

Quantitative surveys was done at baseline and endline, plus qualitative interviews and observations, gathered comprehensive data.

Measurement Variables

Dependent, independent, and control variables measured skill acquisition, employment outcomes, and institutional factors.





Impact estimation: Propensity Score Matching and Difference- in-Differences

Propensity Score Matching

PSM matched treatment and control groups based on observed variables to reduce selection bias in impact evaluation.

Average Treatment Effect on Treated

ATT measured the average impact of the treatment on those who actually received the dual-training program.

Difference-in-Differences Model

DiD estimated treatment effect by comparing changes over time between treatment and control groups using longitudinal data.

Ethical considerations

Ethics Review Approval

The study obtained approval from Ethics review board ensuring research integrity.

Voluntary Participation

Participation was voluntary with informed consent obtained from all respondents.

Data Anonymization

Data was anonymized to secure respondent confidentiality and privacy.



Descriptive Statistics and Baseline Characteristics

Participant demographics and group comparability

CHARACTERISTICS	TREATMENT (N=200)	CONTROL (N=200)	P-VALUE
Average Age(years)	23.9	23.7	0.452
Female (%)	53%	51%	0.617
Prior Hospitality experience (%)	21%	20%	0.833
Average Household Income (Ksh)	32,500	31,900	0.701

Skills Profiling and Training Gaps at the Agrifood– Hospitality Nexus

Employer-driven skills mapping and technical/soft skills demand-(Profile of Skills at the AFH Nexus)

SKILL AREA	% OF EMPLOYEES AS CRITICAL
Food Safety & Hygiene (HACCP, ISO 22000)	92%
Farm-to-Fork Supply Chain Management	81%
Culinary Innovation with Local Ingredients	78%
Digital Menu Engineering & Costing	65%
Sustainable Sourcing & Waste Reduction	60%

Audit of current training provision and curriculum gaps



Food Safety Gaps

Only 2 out of 6 programs include a dedicated HACCP module; most cover only basic hygiene.

Lack of Supply Chain Training

No curricula included farm-to-fork logistics or traceability in supply chain education.

Limited Digital Skills

Only one program covers digital costing or menu engineering tools essential for hospitality.

Minimal Sustainability Coverage

Sustainability topics like food waste reduction are minimally covered and mostly theoretical.

Impact of Dual-Training Model: Skills, Job Quality, and Labor Market Outcomes

Skill acquisition outcomes and ATT estimates

OUTCOME VARIABLE	TREATMENT MEAN	CONTROL MEAN	ATT	STD. ERROR	P-VALUE
Technical Skills Test (%)	84.6	75.8	8.8	2.45	0.001***
Food Safety Compliance Score (%)	88.2	78.9	9.3	2.60	0.000***
Soft Skills Index (0–10)	8.5	7.7	0.8	0.32	0.012**

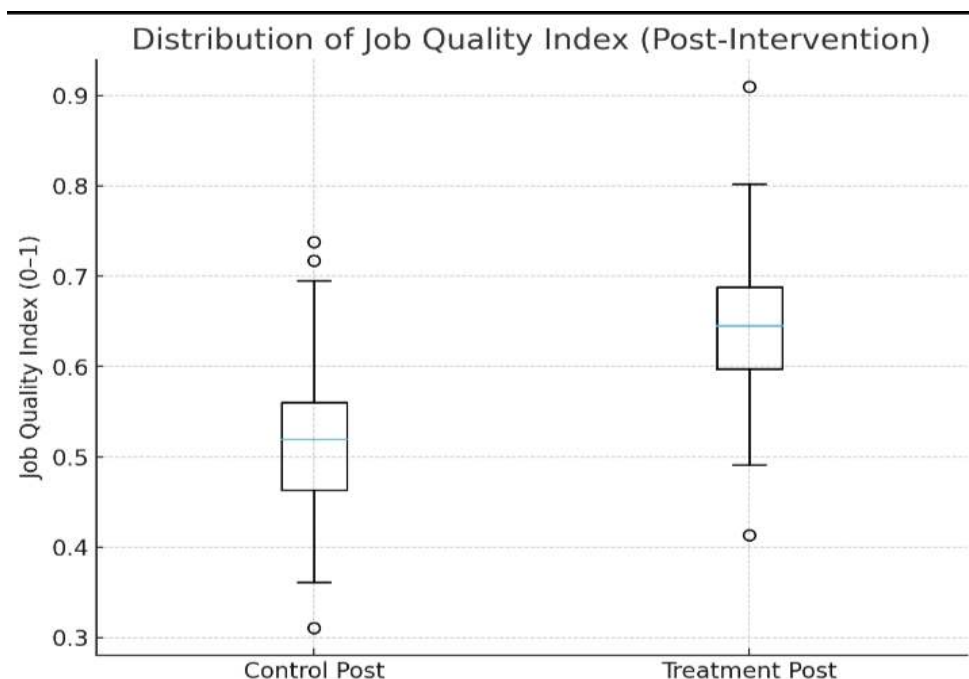
Impact on job quality: earnings, contracts, satisfaction (Table 4.4)

INDICATOR	TREATMENT MEAN	CONTROL MEAN	DIFFERENCE	P-VALUE
Average Monthly Earnings (KES)	46,500	38,000	+8,500	0.028**
Formal Contract (%)	66%	50%	+16pp	0.015**
Job Satisfaction (0–5 scale)	4.3	3.8	+0.5	0.010**

Difference-in-Differences results and labor market impacts

OUTCOME VARIABLE	COEFFICIENT	STD. ERROR	P-VALUES
Employment rate (1=employed)	0.120	0.051	0.021**
Monthly earnings (KES '000)	8.000	3.720	0.034**
Formal contract (1=formal job)	0.160	0.068	0.018**

Visualization of job quality improvements



Job Quality Index Overview

The Job Quality Index measures various aspects of employment conditions post intervention.

Post-Intervention Improvements

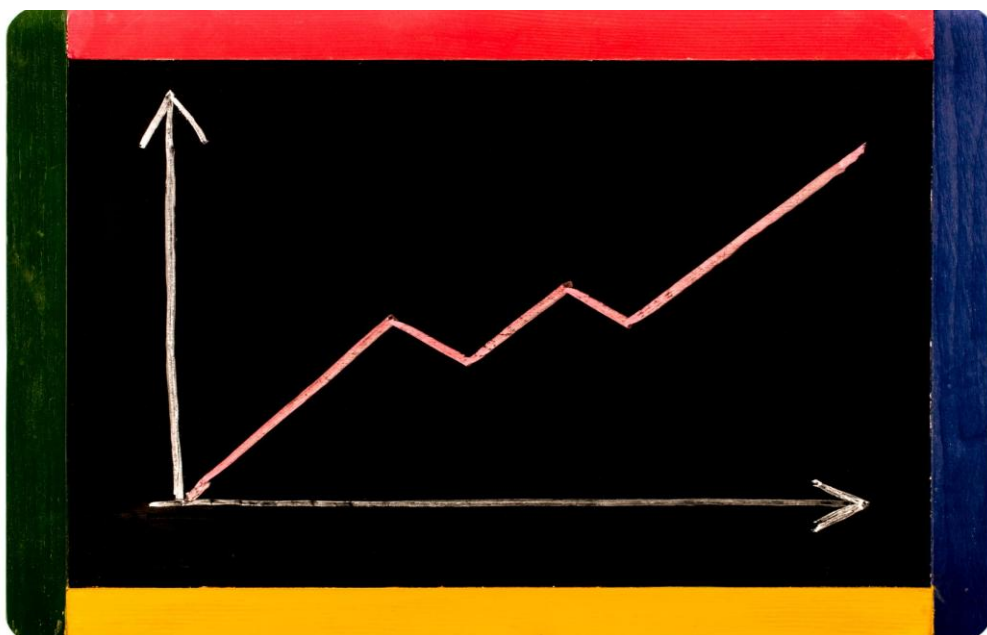
Data indicates improvements in job quality after implementing targeted interventions.

Distribution Analysis

The distribution highlights shifts towards higher job quality scores across the workforce.

Validation of Theoretical Framework and Statistical Power

Empirical validation of human capital, matching, and CBET models



Wage and Employment Gains

Training yields significant monthly wage increases and boosts employment probability by 12 percentage points.

Matching and Signaling Effects

Dual-training graduates show 16% higher formal job attainment and faster job placement.

CBET and Skill Improvements

Competency-based training enhances technical, food safety, and soft skills leading to better performance.

Job Quality Enhancements

Job satisfaction, earnings, and formal contracts increase, linked to food safety and sustainable skills.

Welfare economics and program value



Higher Earnings Benefits

The program led to increased earnings, improving economic welfare for individuals and firms.

Improved Productivity

Firm productivity improved through reduced food wastage and better regulatory compliance.

Positive Externalities

The program created social benefits such as safer food systems benefiting the wider community.

Positive Net Present Value

Overall, the program's net present value was positive, and supporting its social and economic expansion.

Statistical power analysis and study robustness

OUTCOME	EFFECT SIZE (D)	POWER(1-B)
Technical Skills Score	0.45	0.84
Monthly Earnings	0.41	0.81
Job Quality Index	0.36	0.76

Policy Implications and Recommendations

Curriculum reform and skills alignment

Need for Curriculum Reform

Current training does not meet employer demands, highlighting a need for competency-based curriculum redesign.

Incorporating Industry Modules

Embedding HACCP, farm-to-fork logistics, digital menu engineering, and sustainable sourcing in programs ensures relevancy.

Alignment with Job-ready Skills

Revised curricula will equip graduates with skills aligned to evolving hospitality industry needs.



Public–private partnerships and scaling for inclusion

Public–Private Partnerships

Dual-training models linking classroom and on-site placements enhance skills and workforce readiness. Incentives motivate private sector involvement.

Scaling and Inclusion

Expanding dual-training through skills hubs and digital platforms supports women and youth, fostering inclusive growth and entrepreneurship.



Integration with national and continental agendas



Alignment with Kenya's TVET Strategy

Integrating reforms into Kenya's TVET Strategy ensures education and skills development align with national priorities.

Supporting Kenyan Vision and SDG 8

Aligning with Kenyan Vision and Sustainable Development Goal 8 promotes decent work and economic growth.

Integration with AU Agenda

Embedding reforms within the African Union Agenda fosters continental coherence and collaboration.

Mobilizing Financing

Aligning reforms helps mobilize donor and government financing for successful implementation.

Conclusion

Addressing Skills Gaps

The dual-training model effectively tackles skills shortages in Kenya's agrifood and hospitality industries.

Improving Job Quality

This model enhances job quality by providing relevant, hands-on experience to workers.

Policy Insights

Findings offer valuable guidance for shaping future workforce development policies in Kenya.

THANK YOU



**Destaings Nyenyi
Nyongesa, PhD (Econ)**



+254-721-218-992



destaings.nyongesa@bihc.ac.ke
destaingsnyongesa@gmail.com

