



RESEARCH REPORT

D1.6 – Update needs assessment report on teaching methodology

„Ion Ionescu De La Brad”Iasi University of Life Sciences (IULS, Romania)





Co-funded by
the European Union

Erasmus+ CBHE Project CHAIN – 101082963

1. GENERAL RESEARCH PLAN	3
1.1 Research aims and objectives	3
1.2 Methodological plan	4
1.3 Results and discussions	5
2. INTERVIEW RESEARCH	7
2.1 Aim and objectives of the interview	7
2.2 Interview research methodology	8
2.3 Interview results and discussions	10
3. FOCUS GROUP RESEARCH	16
3.1 Focus Group Session aims and objectives	16
3.2 Focus Group Research Methodology	16
3.3 Focus Group results and discussions	19
4. CONCLUSIONS.....	23
Appendix	28





1. GENERAL RESEARCH PLAN

In the current context of globalisation, a deep understanding of entrepreneurial dynamics is essential in higher education institutions. This study focuses on assessing the needs and constraints of teachers in applying teaching methods that stimulate entrepreneurial thinking and innovation potential.

Agriculture, a vital sector, highlights the need for innovative approaches such as holistic agriculture, which integrates sustainable techniques and promotes environmental and social balance.

By exploring attitudes towards entrepreneurial learning, the use of different methodologies and the availability of training opportunities, the study aims to provide concrete recommendations for improving teaching practices and the impact of entrepreneurship education among partner institutions.

1.1 Research aims and objectives

This report aims to update and expand the understanding of the needs and constraints of teaching staff in partner HEIs, focussing on the application of methodologies that stimulate entrepreneurial thinking and innovation potential in the agri-food sector. By analysing teachers' and students' attitudes towards entrepreneurial learning and innovation in teaching, this study explores the use of various pedagogical methodologies and identifies opportunities for appropriate teacher training. This research adopts mixed methodologies, including literature review, semi-structured interviews and online questionnaires, complemented by focus group sessions with teachers, students and representatives from the business community. The aim is not only to capture a current picture of the entrepreneurship education landscape, but also to formulate strategic recommendations for the development of entrepreneurial competences in the specific context of innovative and effective teaching practices. These efforts are directed towards modelling sustainable practices in education, facilitating adaptation to a changing academic and entrepreneurial environment. The research plan includes three main objectives tailored to the context of each partner institution, with a focus on identifying the most effective pedagogical methods and tools to address the specific needs of the agri-food sector.

Finally, a thorough assessment of needs and constraints has been provided and will result in an electronic report with clear recommendations on teacher training to continuously improve entrepreneurial learning. The report emphasises the importance of updating and broadening the understanding of the needs of higher education teaching staff, highlighting the need to integrate methodologies that promote entrepreneurial thinking and innovation in the agri-food sector. By investigating attitudes towards learning and innovation, the study provides insight into methodological diversity and training opportunities, essential for adapting to the dynamics of the educational market. Utilising mixed research methodologies, this study captures both the current perspectives of teachers and students, as well as representatives of the business community, focusing on identifying effective pedagogical practices. The aim is to formulate strategic recommendations for the enhancement of entrepreneurial competences that are

essential in shaping sustainable and innovative educational practices adapted to the continuously changing academic and entrepreneurial environment.

The finalised report proposes clear directions for the further development of entrepreneurial competences in the specific context of the partner HEIs. The thorough assessment of needs and constraints results in concrete recommendations for the optimisation of teaching methodologies and teacher training, emphasising the need for pedagogical approaches that respond effectively to the challenges of the agri-food sector.

1.2 Methodological plan

The need for this plan was to update data on the needs and constraints of higher education teachers in the context of applying teaching and learning methodologies that stimulate entrepreneurial thinking and innovation. Using innovative research methods, including semi-structured interviews, online questionnaires and focus group sessions, the study aims to analyse the attitudes of teachers, students and the business community towards entrepreneurial learning in the agri-food sector. The main aim of these activities is to identify and synthesise the specific challenges, opportunities and needs of these groups, thus facilitating the formulation of recommendations for teacher training. By collecting and analysing data, the study aims to elaborate a set of key competences and develop strategies tailored to the educational needs of the agri-food sector, contributing to the strengthening of a robust and innovative entrepreneurial environment in higher education institutions.

The semi-structured interviews, conducted both online and face-to-face, involved entrepreneurs, teachers and students from partner HEIs. They aimed to assess their perspectives on the application of teaching and learning methodologies that stimulate entrepreneurial thinking in the agri-food sector, identifying specific challenges and opportunities. The objectives of the interviews were: a. To identify the challenges faced by entrepreneurs in applying entrepreneurial concepts. b. To assess the teachers' needs for training in innovative teaching methodologies. c. Highlighting barriers for students in accessing entrepreneurship education. The results have been summarised in reports detailing these issues, together with recommendations for improving curriculum and teaching methodologies. The Focus Groups were intended to consolidate the results of the interviews and questionnaires through in-depth discussions with members of the academic and entrepreneurial community: Focus Group 1 highlighted the directions in which a common set of key competences needed for teachers implementing and teaching holistic agriculture principles should be developed.

This three-dimensional approach integrates the analysis of educational needs with the identification of required competences, with the aim of developing strategies tailored to each partner institution. The results of this research are intended to inform and continuously improve teaching practices and contribute to the creation of a robust and innovative entrepreneurial environment in higher education.

The research design shed light on the needs and constraints faced by higher education teachers, emphasising the importance of applying teaching methodologies that promote entrepreneurial thinking and innovation. The use of research methods, including semi-structured interviews and focus groups, allowed a detailed analysis of teachers' and students'



attitudes towards entrepreneurship education in the agri-food sector, thus providing a solid basis for formulating educational recommendations. The interviews highlighted the specific difficulties encountered by entrepreneurs in applying entrepreneurial concepts, as well as the needs of teachers to train in innovative teaching methodologies. These discussions helped to identify the barriers that students face in accessing entrepreneurship education, thus emphasising the urgent need to improve the curriculum and teaching methodologies to effectively support the development of entrepreneurial competences.

The focus groups reinforced the results of the interviews and questionnaires, facilitating in-depth discussions on the development of teaching skills needed in the agri-food sector. This collaborative method enriched the shared understanding of key competences and development directions essential for teachers implementing holistic and entrepreneurial farming principles. Thus, the study provided strategies tailored to the specific needs of each partner institution, contributing to the continuous evolution of entrepreneurship education.

1.3 Results and discussions

The analysis of the research findings provides a detailed insight into the application of teaching and learning methodologies in the partner universities, emphasising the importance of adaptability, innovation and interdisciplinarity in addressing the complex challenges of the modern world. Each research method illuminates different aspects of the needs and constraints of teaching staff, highlighting how an integrated approach can improve educational processes and stimulate entrepreneurial thinking. The research results show that interdisciplinarity is crucial in entrepreneurship education, emphasising the need for adaptability and collaboration between different academic fields in order to respond effectively to contemporary educational and societal challenges. Interdisciplinarity is valued not only for its capacity to generate innovative solutions, but also for its role in the development of essential transversal competences such as critical thinking and adaptability. These competences are vital for the continued success of teachers and students in an ever-changing academic and professional environment.

The analysis also emphasises the crucial role of entrepreneurship in the agri-food curriculum, highlighting the urgent need for teachers to adopt innovative and adaptive methodologies. Educational entrepreneurs and teachers are encouraged to explore and implement innovative practices that can transform the agri-food educational landscape, tackling challenges and maximising opportunities for the sector. The research explored in detail how different pedagogical methodologies influence innovation and entrepreneurial thinking among teachers and students. The dynamics of the interactions and the feedback received emphasise how the adaptability and quality of discussions in learning sessions can directly influence the generation of innovative ideas, applicable in the continuous improvement of pedagogical practices.

These results, derived from diverse research methodologies, illustrate the complexity and interdependence of factors contributing to professional and entrepreneurial development in higher education. They emphasise the need for a holistic and integrated approach in teaching and research, showing how different perspectives can contribute to a better understanding of



educational needs and to the identification of effective and sustainable solutions to foster entrepreneurial thinking. The analysis of the research results emphasises the essential role of interdisciplinarity in entrepreneurship education, demonstrating how adaptability and collaboration between different academic disciplines are crucial to respond to current educational and societal challenges. This approach not only facilitates innovation, but also contributes to the development of key competences, such as critical thinking and adaptability, which are vital in a dynamic academic and professional environment.

The research findings also emphasise the importance of integrating entrepreneurship into the agri-food curriculum, highlighting the need for teachers to adopt and implement innovative and adaptive pedagogical methodologies. This could revolutionise the agri-food education sector, providing teachers and students with the tools to navigate and exploit the emerging opportunities of this expanding sector.

Through its diverse research methodologies, the study illustrates the complexity and interdependence of the factors involved in the development of professional and entrepreneurial competences in universities. The focus on a holistic and integrated approach in pedagogy and research emphasises how different perspectives can enhance the understanding of educational needs and identify effective solutions to stimulate innovative and entrepreneurial thinking.

2. INTERVIEW RESEARCH

The research design assessed the use of teaching and learning methods that stimulate entrepreneurial thinking and innovation potential in higher education, with a particular focus on the agri-food sector. The study involved semi-structured interviews with three main groups in different countries: entrepreneurs, academics and students, with more than 30 people selected per country to reflect the diversity and complexity of the sector. The sample targeted entrepreneurs of different sizes and types of businesses, ranging from agricultural production to trade and services, as well as academics and students in relevant fields. The interviews aimed to identify teachers' attitudes towards entrepreneurial learning, difficulties in implementing innovative teaching methods and needs for further training. This method of data collection provided an in-depth understanding of teachers' needs and constraints, as well as students' and the business community's perceptions of entrepreneurship education.

The results of the study will be analysed to develop specific recommendations which will be presented in an electronic report. These recommendations will aim at improving and adapting teaching methodologies to encourage innovative and entrepreneurial thinking among students, thus enriching the innovation potential of higher education. This analysis also includes the emerging perspectives of young people, emphasising the importance of tailoring educational and entrepreneurial support to their specific needs.

2.1 Aim and objectives of the interview

The aim of these interviews was to update and understand the skills, challenges and opportunities in higher education in the context of stimulating entrepreneurial thinking and innovation. In light of global economic changes and increasing pressures for sustainability, the research aimed to capture the multiple perspectives of academics, students and the business community on innovative and entrepreneurial teaching and learning methodologies.

a. For entrepreneurs - the interviews aimed to identify key entrepreneurial competences and challenges in the agri-food sector, exploring how these competences contribute to sustainable development and economic performance. It also investigated the impact of entrepreneurial initiatives on the socio-economic and business environment.

b. For teachers - the focus was on teachers' attitudes and observations of entrepreneurial learning and innovation in teaching. The availability and effectiveness of training opportunities for teachers, such as workshops and seminars, aimed at improving entrepreneurship and innovation-orientated pedagogical approaches was analysed.

c. For students - student perceptions of entrepreneurial learning and innovation in teaching were assessed. The study investigated the impact of these educational methods on their entrepreneurial aspirations and their recognition of barriers and opportunities in the agri-food sector.

The results obtained will contribute to the development of an electronic report with specific recommendations for optimising the curriculum and pedagogical strategies in higher

education institutions, stressing the importance of adapting to labour market requirements and new global trends in education and entrepreneurship.

2.2 Interview research methodology

Interview data collection was carried out at each partner university by 4-6 specialized researchers (in teams of two). In order to ensure better responsiveness from employers, face-to-face interaction was preferred, either at their premises or at the university. Students and teachers were interviewed at the university premises.

The interview was conducted through direct and individual interaction with the subjects, thus ensuring the protection of personal data and obtaining adjacent information relevant to the objectives pursued by the research topic.

Interview guides were developed to support the field research specialists. These guides included guiding questions related to the objectives of the interview and explanations of how, when and where to conduct the interview. The guides were specifically tailored to each category of subjects: entrepreneurs, students and teachers.

The research sample consisted of a minimum of 30 people per country and included:

1. At least 20 agri-food entrepreneurs identified according to their position in the agri-food supply chain and economic size:

- Agricultural production (vegetable, livestock, poultry, bee, fish, vegetable, fruit farms, etc.):
 - At least 1 entrepreneur with a large farm;
 - At least 2 entrepreneurs with medium size farms;
 - At least 4 entrepreneurs with small farms;
- Processing of agricultural products (workshops and factories processing milk, meat, vegetables, fruit, etc.):
 - At least 1 entrepreneur with a large enterprise;
 - At least 2 entrepreneurs with medium-sized enterprises;
 - At least 4 entrepreneurs owning small enterprises;
- Trade and other services (shops, restaurants, hotels, etc.)
 - At least 1 entrepreneur owning a large enterprise;
 - At least 2 entrepreneurs owning medium sized enterprises;
 - At least 4 entrepreneurs owning small businesses;

2. At least 5 university professors with specialisations such as agri-food technology, agri-food economics, law, marketing, food safety or other fields specific to the agri-food sector in the partner country;

3. A minimum of 5 final year students from agri-food specialisations, including one student each from agriculture, the food industry, commerce and other service sectors.

This sample was considered relevant to the interview objectives because:

- Entrepreneurs in the three links of the agri-food supply chain are aware of the issues of the entrepreneurial environment and the skills needed in this area;
- Teachers have information based on academic research about the agri-food sector and the skills needed for employment and entrepreneurship in the sector;

research ethics, while the use of digital technology facilitated efficient collaboration between research teams.

In conclusion, the meticulous methodology used in this research has highlighted the importance of adapting data collection and analysis methods to the specificities of each sector studied. The results obtained provide a solid basis for the further development of educational and entrepreneurial practices in the partner universities, thus contributing to increasing the capacity for innovation and adaptability in the face of changes in the dynamics of the agri-food sector.

2.3 Interview results and discussions

In an ever-changing global economic landscape, entrepreneurs face dynamic challenges and opportunities that shape the way business is conducted. The aim of this synthesis is to explore and update the evidence on the needs and constraints of higher education staff, with a particular focus on teaching and learning methods that stimulate entrepreneurial thinking and innovation potential. It examines the attitudes of academics, the availability of training opportunities and the insights of the business community in the higher education context, providing a valuable perspective on the integration of entrepreneurship education into academic curricula.

Section 1: Economic Background and Innovations

Despite an often volatile economic climate characterised by inflation, rising production costs and fluctuating market demand, entrepreneurs in Kenya, Nigeria and Togo report a number of strategic adaptations that have enabled them not only to survive, but to thrive. In Kenya, a focus on technological innovation has enabled many agribusinesses to improve production efficiency. The use of advanced technology, such as automated irrigation systems and modern farming techniques, has been instrumental in optimising resources and reducing waste.

In Nigeria, food entrepreneurs have reported increased revenues, attributing success to rapid adaptation to consumer preferences and expansion of outlets. This adaptability is reflected in the opening of new restaurants and fast-food outlets in urban areas, where demand is growing due to accelerated urbanisation.

In Togo, economic challenges have been met with strategies to diversify products and explore new markets. For example, agricultural entrepreneurs have invested in alternative crops that are less vulnerable to market fluctuations, such as medicinal and aromatic plants, which are in high demand both locally and on international markets.

Section 2: Environment and Climate Change

The impact of climate change is an ongoing concern for entrepreneurs in all three countries. In Kenya, where agriculture is highly dependent on climatic conditions, entrepreneurs have reported significant losses due to prolonged droughts. In response, many businesses have invested in water harvesting and storage technologies and drought-tolerant seeds to ensure the sustainability of production.



Nigeria faces similar problems, particularly in regions where agriculture is dominant. Here, entrepreneurs have adopted strategies such as crop rotation and precision farming to minimise the negative impact of environmental changes on production. These practices not only improve the efficiency of resource use, but also help to conserve biodiversity and reduce soil erosion.

In Togo, where access to drinking and irrigation water is often limited, entrepreneurs have explored innovative solutions such as solar irrigation systems and rainwater harvesting. These initiatives have not only mitigated the effects of drought, but also paved the way for more environmentally friendly and profitable farming practices in the long term.

Section 3: Social and Demographic Dynamics

Demographic changes are having a profound impact on the way entrepreneurs run their businesses. In all three regions, declining birth rates and migration to cities have created new challenges and opportunities. In Kenya and Togo, for example, the migration of young people to cities has led to labour shortages in rural areas, forcing entrepreneurs to automate processes and offer better conditions to attract and retain workers. In Nigeria, urbanisation has led to increased demand for products and services in cities, opening up new markets for entrepreneurs.

Skills, constraints and innovation: An analysis of higher education in African agriculture

In the context of globalisation and the knowledge economy, universities in Africa are challenged to develop skills that respond to labour market needs and promote innovation and entrepreneurship. The current research analyses data on the needs and constraints of university staff and students.

Interviews with over 300 students in agribusiness, food security and agricultural extension provided valuable data on their educational and professional experiences. The interviews were structured around six main themes: educational experiences, strengths and weaknesses, perceptions of entrepreneurial learning, opportunities and constraints, and feedback on teaching methods.

Educational and Professional Experiences

Kenya: Students value international exchange programmes and highlight the positive impact of exposure to new agricultural technologies and practices. One student commented: "The experience in Germany opened my eyes to sustainable farming methods that can be applied back home".

Nigeria: With a focus on integrating technology into education, students are actively involved in research projects using digital and AI technologies to optimise agricultural production.

Togo: Internship experiences provide an important link between the theory learned in the classroom and agricultural practice, with students reporting a deeper understanding of real-world challenges in agriculture.





Innovation in Teaching and Methodologies

Regional differences highlight a variation in the use of innovative teaching methods. In Kenya, there is greater use of simulations and role-playing in the classroom, while in Togo the emphasis is on traditional methods, highlighting the need for resources to support the transition to more interactive methods.

Opportunities and Constraints

Opportunities: Mentoring programmes and incubators are seen as essential to support student entrepreneurship. Students in Nigeria have more access to such resources than those in Togo.

Constraints: Inadequate funding and limited access to technology are common problems in all three countries. Students suggest that closer partnerships with industry could help alleviate these constraints.

The recommendations focus on improving educational infrastructure and supporting innovation in universities:

- **Infrastructure development** - It is essential to modernise laboratories and classrooms to support technology and research-based teaching methods.
- **Partnerships with industry** Expand collaboration with companies in the agri-food sector to facilitate internships and applied research projects.
- **Mentoring programmes** Implement mentoring programmes led by experts and successful entrepreneurs to guide students in developing entrepreneurial skills.

This detailed analysis not only responds to the research objectives, but also provides a sound basis for future educational strategies to promote innovation and entrepreneurship among higher education students in the three African countries analysed.

Entrepreneurship education and innovation in higher education have become global imperatives in the current economic and social context. Universities in Kenya, Nigeria and Togo, represented through the voices of the academics interviewed, reflect a diversity of perspectives and challenges in implementing these educational approaches. This report aims to analyse and compare their attitudes and perceptions, providing a basis for understanding the specific needs and constraints of each region.

The analysis is based on responses collected through structured interviews in three different African countries. The data were interpreted using thematic analysis to identify and compare key trends and differences in perceptions of entrepreneurial learning and teaching innovation.

Kenya: Teachers indicate a growing interest in interactive and student-centred teaching methods. A noted strength is the adaptability of the curriculum to labour market dynamics and the entrepreneurial needs of students. However, challenges include limited resources and the need for greater government and industry support for innovative educational initiatives.

Nigeria: Teachers highlight an increased awareness of the importance of entrepreneurship education as a means of tackling youth unemployment. Methods used include real case studies



recognition of the role they can play in addressing global challenges such as climate change and food security.

Dealing with global uncertainties and challenges

The themes describe different strategies for dealing with global uncertainties and challenges such as climate change, market volatility and limited access to resources. These include developing new skills, such as advanced knowledge of genetics to develop resilient crop varieties, or adapting to new marketing and communication methods, including the use of social media to reach wider audiences. Meeting these challenges requires a combination of technical knowledge, social skills and adaptability, underlining the importance of an education that prepares students and professionals for a rapidly changing landscape.

Skills development and lifelong learning

Respondents emphasise the need for continuous skills development, both technical and soft skills, to remain relevant in an evolving labour market. This includes, for example, communication and teamwork skills, which several respondents identified as essential for success in their field, as well as the advanced technological skills needed to innovate and improve production processes. This underlines the importance of education and training programmes that provide a solid knowledge base but also encourage lifelong learning.

Resilience and optimism in the face of challenges

Despite the challenges identified, there is a strong sense of resilience and optimism in the respondents' responses. This is evidenced by an ambition to explore new opportunities, an ability to adapt to change and a desire to make a positive difference in their communities. The confidence and optimism expressed by the subjects in the face of uncertainty suggests a strong will to overcome obstacles and contribute to building a better future, both for themselves and for society as a whole.

Teachers' attitudes towards entrepreneurial learning are thus strongly influenced by current economic dynamics. In Kenya, Nigeria and Togo, teachers recognise the need to adapt the curriculum to economic and technological realities. The use of advanced technologies and rapid adaptation to market demands are emphasised as essential for preparing students to be entrepreneurial and to contribute to the prosperity of agricultural enterprises through innovation and efficiency.

Climate change is a major concern, and teachers' responses indicate a recognition of the need to integrate sustainable practices into education. In Kenya, investment in water-saving technologies and drought-resistant seeds is seen as essential to ensure sustainability and to adapt education to changing environmental conditions, which is also relevant to the university curriculum.

Changing demographics and urbanisation are influencing how entrepreneurship education is perceived and implemented. Educators in Kenya and Togo note the challenges of labour shortages in rural areas and recognise the need to adapt teaching methods to attract and retain young people in the agricultural sector by providing applied and relevant training.



Students' educational and work experiences highlight the importance of international exposure and the integration of technology into the curriculum. Educators emphasise the positive impact of exchange programmes and the use of new technologies, such as AI, to enhance students' entrepreneurial skills.

The methods used vary from simulations and role-plays in Kenya to traditional methods in Togo. Teachers recognise the need for resources to support the transition to more interactive and student-centred teaching methods that stimulate critical thinking and creativity.

Access to mentoring programmes and business incubators varies from region to region. In Nigeria, teachers and students benefit from more resources, while in Togo, insufficient funding and limited access to technology are seen as major barriers to the development of entrepreneurship education.

Teachers' recommendations include developing close partnerships with industry to facilitate internships and applied research projects. These collaborations are essential to link theory to practice and to provide students with real-world experience that they can later use in their entrepreneurial careers.

Teachers' responses emphasise the importance of continuous development of technical and soft skills. Training programmes should promote lifelong learning and ensure that students are prepared for a dynamic and changing labour market.

Concerns about sustainability and social responsibility are often cited by teachers who see entrepreneurship education as a way to address global challenges such as climate change and food security. Education needs to reflect this commitment to sustainable and ethical practices.

A strong sense of resilience and optimism emerges from teachers' responses, emphasising the desire to overcome challenges and contribute to building a better future. This mindset is essential in educating business leaders and innovators to successfully navigate the global economic and social landscape.



Nigeria and Togo. Participants attended individual sessions organised in each country, with approximately ten people attending each session. The discussions were structured as role-plays involving key actors in the holistic agri-food sector, such as entrepreneurs, exporters, representatives of support organisations, teachers, researchers, bankers and consumers. The main aim of these discussions was to explore specific needs, constraints and methods to stimulate entrepreneurial thinking and innovation potential in holistic agriculture.

This meeting was held at the project coordinator's premises as part of the meeting of all the teams involved in the project.

Participants: Professors and researchers from two universities each in Kenya, Nigeria and Togo.

Individual sessions per country (about 10 people).

Role-play discussions with key actors in holistic agri-food systems:

Roles

1. Agri-food entrepreneur
2. Agri-food exporter/importer
3. Representative of an organisation supporting agri-food entrepreneurs
4. Ministry of Agriculture
5. Teacher and researcher
6. Banker
7. Consumer

For each objective, a case study has been imagined describing a negative event that creates a problem relevant to each objective.

The role play will be in the form that each participant will have to tell the others how they could contribute to solve the problem (1 minute/each), then the other participants can propose to correct these solutions (5 minutes). The corrected solutions were sent by each member, for the role they played, to the whatsapp group.

Group Focus Scenario

Entrepreneurship in Holistic Agri-Food

This focus group scenario is designed to gather qualitative data from a diverse group of participants involved in the holistic agribusiness sector, including teachers, researchers, entrepreneurs, bankers and government representatives from Kenya, Nigeria and Togo. The aim is to explore the specific needs, constraints and methods for stimulating entrepreneurial thinking and innovation potential in holistic agriculture, with a focus on creating innovations and turning them into successful businesses.

For each country, a separate research section will be conducted in different rooms with the help of the following facilitators:

Section A Focus Group Entrepreneurship in Holistic Agribusiness in Kenya - Moderator Oana Coca

Section B Focus Group Entrepreneurship in Holistic Agro-Food in Togo - Moderator Dan Bodescu





Section A Focus group on holistic agro-food entrepreneurship in Nigeria - Moderator:
Florin Lipşa

Running the sessions

For each objective, a case study will be developed to illustrate a specific challenge. Participants will role-play the holistic agri-food sector to propose and critique solutions to these challenges.

1. Stimulate entrepreneurial thinking

Case study: In a village, a holistic farming initiative is failing due to lack of entrepreneurial skills and limited access to markets. Farmers become discouraged and consider abandoning holistic practices.

2. Stimulating innovation potential

Case study: A group of students develop a new type of organic fertiliser, but find it difficult to test and promote due to limited financial resources and local scepticism.

3. Creating innovation in holistic agriculture

Case study: Researchers discover a revolutionary method of pest control, but collaboration between universities, entrepreneurs and students is weak, preventing widespread adoption.

4. Turning students and entrepreneurs into innovators

Case study: An entrepreneur has an innovative idea for recycling organic waste into energy, but lacks a mentoring system to help him develop the idea.

5. Business transformation in holistic agriculture

Case study: A cooperative tries to adopt holistic practices, but faces resistance from members who fear change and initial investment.

6. Turning innovation into a growing business

Case study: A start-up launches a mobile app to connect farmers with local markets, but faces technical problems and lack of trust from farmers.

Conducting the role play

For each case study

- 1 - Participants will have 1 minute each to present and motivate their solutions from a role-play perspective.
- 2 - After the presentation, the other participants will have the opportunity to suggest adjustments or constructive criticism to the solutions presented.
- 3 - Each participant will send the adapted solutions to the dedicated WhatsApp group, where discussions can continue outside the focus group sessions..

In conclusion, the focus group scenario "Entrepreneurship in Holistic Agribusiness" provides an interactive and participative platform for identifying and solving specific problems in the agri-food sector. Through the use of role-plays and case studies, participants can propose and critique solutions in a constructive and collaborative way. These sessions facilitate the exchange of ideas and best practices, contributing to the development of effective strategies to stimulate innovation and business transformation in holistic agriculture. The discussions and





solutions generated in these focus groups are documented and shared in dedicated WhatsApp groups, ensuring continued dialogue and collaboration between participants after the sessions have concluded.

Privacy and data protection

To ensure transparency and protection of personal data in our focus group sessions, each participant is informed of how the information collected will be used and protected.

Participants were asked to sign an informed consent form prior to the start of the discussions, which detailed the purpose of the data collection, how the data would be used, and their rights under applicable data protection legislation.

All personal data was kept strictly confidential, secure and accessible only to the authorised research team. Audio and video recordings were used only to document and analyse the information discussed and were not published or distributed without the explicit consent of the participants. The identities of participants will be kept anonymous in all reports and publications resulting from these sessions.

Upon completion of the study, all personal data will be deleted or archived in accordance with legal requirements to ensure long-term protection and confidentiality. We are committed to respecting and protecting the privacy of each participant and to ensuring that all data collection and analysis processes are conducted in accordance with the highest ethical and legal standards. For any questions or clarifications regarding the handling of personal data, participants can contact our Data Protection Officer at dan.bodescu@iuls.ro.

In order to organise the focus group sessions efficiently, the following logistical aspects had to be considered:

Venue: Reserve suitable rooms at SEKU and JOOUST, arranged to facilitate group discussions, preferably with round or U-shaped tables to encourage interaction.

Technical equipment: Projectors and screens, audio recorders.

Nametags: For easy identification of participants and to facilitate communication.

Invitations and confirmations: Sending out invitations in good time (see model in the annex to this document) and following up with confirmations of attendance.

3.3 Focus Group results and discussions

In an attempt to evaluate the dynamics and effectiveness of focus group methodology in the context of socio-economic development, this paper aims to explore and identify the critical and outcome aspects of a focus group. This study focuses on a careful and detailed interpretation of participants' responses based on the set objectives, providing valuable insights into group dynamics, quality of discussions, role-specific feedback, innovations and proposed solutions, challenges encountered and recommendations for improvement.

These analyses are fundamental to understanding how the interactions between participants and the structure of focus group sessions can influence the generation of innovative and applicable ideas with a direct impact on policy and practice in developing countries. In an effort to provide a platform for in-depth analytical and relevant discussions, this paper aims to serve as a catalyst for the continuous improvement of qualitative research methodologies, with





the ultimate goal of optimising their contribution to sustainable development and the promotion of collective well-being in the target regions.

1. Group dynamics:

Level of participation and commitment: The active participation and engagement of members was high, reflecting the effective selection of participants for the project. This suggests that the selection criteria were appropriate for the purposes of the group.

Conflicts and synergies: The presence of positive energies indicates a constructive group dynamic, even if there were moments of contradiction. Although the latter may seem counterproductive, they are in fact essential in a focus group as they stimulate discussion and encourage critical thinking and innovative solutions.

Interactions: Respect for assigned roles and active interaction with the facilitator suggest that the role-playing methodology was effective, facilitating effective communication and deep involvement of all participants.

2. Quality of discussions:

Depth and relevance: The discussions were characterised by high depth and relevance, indicating good preparation of the participants and a well thought-out structure of the case studies.

New arguments: The focus on the role of government in stimulating innovation and entrepreneurship shows a clear awareness of the need for supportive policies, reflecting a mature understanding of the economic and social system of which the participants are part.

Areas of difficulty: The difficulties encountered in some of the case studies highlight the need for further clarification of roles and responsibilities and suggest that the scenario instructions could be improved in future sessions.

3. Role-specific feedback:

Scenario approach: the role of the state was received reluctantly by the participant who played it, suggesting either a distrust of the effectiveness of government intervention or a lack of comfort with the role, which may indicate an area for improvement in participant selection or training.

4. Innovative ideas and proposed solutions:

Creative solutions: Discussions on the development of student incubators highlight the innovative thinking and forward-looking vision needed to transform the academic and entrepreneurial environment.

Concrete proposals: The emphasis on the role of the state in supporting innovation and entrepreneurship provides a clear direction for future action that can be applied to public policy.

5. Challenges and obstacles:

Common challenges: Inadequate funding and limited education are recurring challenges in developing countries, and their identification in the discussions confirms the relevance and applicability of the issues raised to local realities..



The idea of creating incubators in universities to support the commercialisation of innovations was discussed. There was talk of creating a special fund to support agricultural start-ups, managed by a collaboration between the state and the private sector. The role of the media in promoting successes in agricultural innovation to inspire and motivate the whole community was emphasised..

Creating innovations in holistic agriculture

The discovery of a new method of pest control by researchers was greeted with enthusiasm, but poor collaboration between universities, entrepreneurs and students has hindered widespread adoption. The importance of establishing common platforms for communication and cooperation between these entities was discussed.

Participants suggested the creation of programmes for the exchange of experience and knowledge between academia and industry. There was agreement on the need to integrate entrepreneurship and innovation courses into university curricula.

It was suggested to use digital technologies to facilitate collaboration and accelerate innovation processes. One participant suggested organising hackathons and idea competitions bringing together students, researchers and entrepreneurs.

The need for government policies to stimulate innovation and interdisciplinary collaboration was recognised.

Discussions highlighted the importance of continued funding and adequate resources for applied research. The difficulty of convincing farmers to adopt new methods without concrete evidence of their effectiveness was mentioned. The creation of centres of excellence for agricultural innovation to act as hubs for the dissemination of new technologies and practices was discussed. The need for continuous mentoring and guidance for young researchers and entrepreneurs in the field was emphasised.

This information highlights the challenges and solutions proposed by focus group participants, providing a solid basis for future initiatives and improving current practices in the agricultural sector.



4. CONCLUSIONS

The analysis of teachers' attitudes towards entrepreneurship learning highlighted the need for innovation in teaching, the use of different methodologies, the availability of training opportunities for teachers, and teachers', students' and business community's observations of entrepreneurship learning in the targeted partner universities.

Higher education teachers in Kenya, Nigeria and Togo are aware of the need to adapt the curriculum to rapid economic and technological change. This adaptation not only helps to maintain the relevance of education, but also ensures that students are well prepared to enter an evolving labour market, thereby improving their career prospects in a competitive global landscape.

There is a growing recognition among educators of the impact of climate change on agriculture, which has led to the integration of sustainable practices and new technologies into curricula. This reflects a responsibility to train a new generation of professionals capable of implementing and promoting environmentally sound and efficient agricultural practices..

Changing demographics, characterised by accelerating urbanisation and declining birth rates, pose a significant challenge for educators to find effective ways to attract and retain young people in rural areas. Entrepreneurship education focused on technological innovation is proving to be a promising strategy in this regard.

International experience is extremely valuable for students, and teachers actively support participation in exchange programmes that expose students to new technologies and agricultural practices. These experiences enrich learning and open students' eyes to sustainable methods that can be effectively applied at home.

In Nigeria, the integration of technology into education is evident, with students involved in projects using artificial intelligence to optimise agricultural production. This not only improves learning outcomes, but also prepares students for careers in advanced technology sectors.

Internships in Togo provide a valuable bridge between academic theory and agricultural practice, helping students gain a deep understanding of real-world challenges and develop applicable solutions. This is an essential component of education as it links theoretical knowledge with the practical reality of field work.

Regional differences in teaching methods highlight the diversity of educational approaches in different countries. For example, the use of simulations and role-playing is common in Kenya, while traditional methods are emphasised in Togo. This diversity points to



the need for additional resources to support the transition to more interactive and learner-centred methods.

Access to resources such as mentoring programmes and business incubators varies considerably between regions. In Nigeria, students benefit from a wide range of opportunities compared to Togo, where financial and technological constraints are major barriers to the development of entrepreneurship education.

Partnerships with industry are essential to linking theory with practice, providing students with learning opportunities through internships and applied research projects. These collaborations not only enrich the educational experience, but also enhance the employability of graduates.

The importance of continuous skills development, both technical and soft skills, is emphasised by teachers who recognise that the changing labour market requires constant adaptation. Continuing education programmes are therefore essential to maintain the professional relevance of graduates.

Teachers place particular emphasis on improving educational infrastructure to support technology and research-based teaching methods, underlining the need to modernise facilities to keep pace with innovations in the education sector.

The need for entrepreneurship education to address global challenges such as climate change and food security is frequently mentioned. This highlights the importance of a commitment to sustainable and ethical practices in the education of future business leaders and innovators.

The resilience and optimism shown by teachers in the face of challenges reflects a strong desire to overcome obstacles and contribute to building a better future. This positive attitude is essential to inspire and motivate students to pursue entrepreneurial and innovative careers.

The consensus among educators that entrepreneurship education can act as a catalyst for economic and personal development demonstrates a recognition of the value of this type of education in stimulating economic growth and improving individual lives.

Challenges identified in the focus group sessions, such as inadequate funding and limited access to educational resources, highlight the need for improved strategies to maximise the impact of entrepreneurship education.

Discussions on the role of government in stimulating innovation and entrepreneurship highlight the need for supportive policies that facilitate innovative initiatives and promote a strong entrepreneurial culture.



Core competencies identified in the research include adaptability to technological and market changes, expertise in modern technologies, implementation of sustainable practices, advanced communication and collaboration skills, entrepreneurship and innovation skills, critical thinking, leadership, research and analytical skills, strategic planning, and a deep commitment to ethics and social responsibility.

Adaptability and flexibility

Entrepreneurs and educators need to develop outstanding adaptability to respond dynamically to rapid changes in the global economy. This includes rapid adaptation to new technologies and market demands, as well as the ability to innovate in teaching methods to improve the effectiveness and relevance of education.

Use of advanced technology

Competence in the use of advanced technologies, such as automated irrigation systems and artificial intelligence, is crucial for optimising production and running sustainable businesses. This requires a deep understanding of technology applications and the ability to integrate them into existing processes.

Sustainability and resource management

The ability to implement sustainable practices and manage resources effectively is essential in the face of climate change. This includes developing resilient crops and innovative uses of scarce resources such as water to ensure long-term sustainability.

Social and communication skills

Communication and social interaction skills are essential for managing the complexity of relationships within the business and academic communities. These skills help to build effective partnerships, conduct productive discussions and create supportive networks.

Entrepreneurship and innovation skills

The ability to identify market opportunities and develop innovative solutions is crucial for entrepreneurs and students. This involves creative thinking, risk assessment and the ability to turn ideas into competitive products or services.

Critical thinking and problem solving

Critical thinking and problem solving skills are essential to evaluate different business and academic situations, deal with challenges and develop effective strategies. This is necessary to navigate complex scenarios and optimise decisions.

Leadership and team management

The ability to lead and manage teams is fundamental to the development of entrepreneurial and educational projects. This requires not only management skills, but also the ability to inspire and motivate teams to work towards common goals.





Research and analytical skills

The ability to conduct rigorous research and analyse data is essential in science and entrepreneurship. These skills help to base decisions on evidence and promote knowledge-based practice and innovation.

Strategic planning skills

Strategic planning is necessary for long-term success, enabling entrepreneurs and educators to anticipate market changes and develop effective plans that address both immediate needs and long-term goals.

Ethics and social responsibility

In a world increasingly focused on social and environmental impact, the ability to operate in an ethical and responsible manner is increasingly valued. This includes a commitment to sustainable practices, transparency and fairness in all actions taken.

Appendix

Appendix 1 Model interview form for entrepreneurs

INTERVIEW GUIDE*

for entrepreneurs

Interviewer name	Date
---------------------------	------------

Thank you for taking the time to speak with us today.

Our name isand we are
from(University of)

We are a team participating in the research on "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa", necessary for our university to know the problems of the agri-food field.

We assure you that this is not a control. We'll take notes just so we don't miss anything important from the discussion. These notes and the discussion we will have are confidential (they are only for us and will not be available to any administrative institution).

We will talk about aspects of your business and the area in which you operate.

Please feel free to express your opinions. We are here to listen to you.

Question 1 Introductory (5 minutes discussion to relax the atmosphere)

How was 2023? What was the best thing that happened in your business recently?

<i>Synthetic notes</i>

Question 2 Environment and climate change (*discussions will be oriented towards the description of some situations and actions taken*)

What were the main environmental challenges? Did you notice any environmental changes and what did you need to do? What could help you in this regard?



Synthetic notes

Question 3 Demographic situation *(discussions will be oriented towards opinions and actions)*

Is your business affected by the declining birthrate? Are changing concepts of family affecting your business?

Can be discussed: migration, birth, marriage, etc.

Synthetic notes

Question 4 Economic climate *(discussions will be action oriented)*

What were the difficulties you encountered economically?

The following can be discussed: the evolution of prices, malfunctions in supply, the evolution of consumption, etc.

Synthetic notes

Question 5 Social climate *(discussions will be action oriented)*

What were the difficulties you encountered socially?

The following can be discussed: labor migration, unemployment in general and especially among young people, reducing / improving access to education, etc.

Synthetic notes



Question 6 Traditions and manners *(discussions will be action-oriented)*

Is your business based on certain traditions or consumption habits? Have you had to take certain actions to change your consumption pattern?

Can be discussed: current consumption patterns in correlation with traditional ones, difficulties in adapting production to changes in demand, competition of traditional products vs. imported products, etc.

Synthetic notes

Question 7 Psychosocial environment *(discussions will be opinion-oriented)*

Have you noticed changes in the perception of well-being among employees and customers? Did some situations catch your attention? What are the main generational differences in well-being?

The following can be discussed: customer attitude, opinions regarding the competence of young people at the time of employment, opinions regarding the expectations of young people at the time of employment, the general atmosphere of employees in the company, etc.

Synthetic notes

Question 8 Cultural impact *(discussions will focus on opinions and actions taken)*

Do you think there have been important changes in local, regional, national culture? Have you taken any steps to capitalize on or mitigate these changes?



The following can be discussed: the impact of education on the standard of living, the relevance of cultural events for the subjects' business, etc.

Synthetic notes

Question 9 Legislative context *(discussions will be action-oriented)*

Have you had great difficulty in changing some laws? What was the impact of the legislative changes on the business? Does the company, its own employees, partners help you in adapting your activity to the legislative requirements?

Can be discussed: general perception of the legislation, actions determined by legislative changes, etc.

Subjects will be assured that you are not seeking information about any violations of the law and that their responses may not affect them in any way.

Synthetic notes

Question 10 Political climate *(discussions will be oriented towards opinions)*

How would you describe the political climate in a few words? Is this predictable enough? Are there any significant impact changes?

The following can be discussed: political support for entrepreneurs, representation of producers through professional associations or product associations, communication with the ministry representing the branch, etc.

Subjects will be assured that discussions are not about their political choices.

Synthetic notes



Erasmus+ CBHE Project CHAIN – 101082963

Thank you for helping us understand some things about your business. This information is valuable and will be useful in the development of this field of activity.

- a. Assessments regarding subjects' willingness to participate in discussions
- b. Assessments regarding the general ambience of the interview
- c. Assessments regarding mood (optimistic, pessimistic, balanced)
- d. Assessments of subjects' confidence in education and research
- e. Other appreciations depending on the overall impression

Appendix3 Model interview form for students

INTERVIEW GUIDE*

for students

Interviewer name

Date

Thank you for taking the time to speak with us today.

Our name is

We are a team participating in the research on "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa", necessary for our university to know the problems of the agri-food field and the skills needed by specialists in the field in order to develop holistic agriculture.

We assure you that we will only make your answers known in a centralized form without the possibility of association with your name. We'll take notes just so we don't miss anything important from the discussion. These notes and the discussion we will have are confidential (they are only for us and will not be available to any administrative institution).

We will talk about the possibilities of employment or doing a business in the agri-food sector.

Please feel free to express your opinions. We are here to listen to you.

Question 1 Introductory (5 minutes discussion to relax the atmosphere)

How was 2023? What was the best thing that happened to you professionally?

Synthetic notes

Question 2 Strengths for employment (*discussions** will be opinion-oriented*)

What do you think are your strengths for employment in the agri-food sector?

Synthetic notes

Question 3 Weak points for employment (*discussions will be opinion-oriented*)

What do you think are your weaknesses for employment in the agri-food sector? Who or what can help you with this?

Synthetic notes

Question 4 Opportunities for employment (*discussions will be opinion-oriented*)

What do you think are the opportunities that can facilitate your employment in the agri-food sector?

Synthetic notes

Question 5 Threats to employment (*discussions will be opinion-oriented*)

What do you think are the economic difficulties that can limit your employment in the agri-food sector?

Synthetic notes

Question 6 Strengths for entrepreneurship *(discussions will be opinion-oriented)*

What do you think are the strengths you have that are useful for starting an agribusiness?

Synthetic notes

Question 7 Weak points for entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the weaknesses that will make it difficult for you to start an agribusiness? Who or what can help you with this?

Synthetic notes

Question 8 Opportunities for entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the opportunities that can be fruitful for starting an agribusiness?

Synthetic notes

Question 9 Threats to entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the economic difficulties that can prevent you from starting an agribusiness?

Synthetic notes

Question 10 Competencies for employment in agribusiness (*opinion discussions*)

What do you think are the top 3 skills you need if you want to work in a company that implements holistic agriculture?

(Arguments and examples for these are expected)

Synthetic notes



Appendix 3 Model interview form for professors

INTERVIEW GUIDE* for teachers

Interviewer name

Date

Thank you for taking the time to speak with us today.

Our name isand we are from(University of)

We are a team participating in the research on "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa", necessary for our university to know the problems of the agri-food field and the skills needed by specialists in the field in order to develop holistic agriculture. We are interested in the interdependence of agriculture with the frameworks: natural, demographic, psychosocial, historical, economic, cultural, legal, political and institutional.

We assure you that this is not a control. We'll take notes just so we don't miss anything important from the discussion. These notes and the discussion we will have are confidential (they are only for us and will not be available to any administrative institution).

We will talk about aspects in your field of specialization regarding the agri-food sector.

Please feel free to express your opinions. We are here to listen to you.

Question 1 Introductory (5 minutes discussion to relax the atmosphere)

How was 2023? What was the best thing that happened in the agri-food sector from the perspective of your specialization?

Synthetic notes



Question 2 Strong points favorable to the implementation of holistic agriculture (*discussions** will be opinion-oriented*)

What do you think are the strengths of the national agri-food sector that would favor the implementation of holistic agriculture?

Synthetic notes

Question 3 Weaknesses for the implementation of holistic agriculture (*discussion of subject views*)

What do you think are the weaknesses of the national agri-food sector that would hinder the implementation of holistic agriculture?

Synthetic notes



Question 6 Competencies for employment in agribusiness *(opinion discussions)*

What do you think are the top 3 skills needed for college graduates who want to work for a company that implements holistic agriculture?

(Arguments and examples for these are expected)

Synthetic notes

Question 7 Competencies for agribusiness entrepreneurship *(discussions about subjects' views on what an entrepreneur in this field needs to know, be able to do)*

What do you think are the top 3 skills that an entrepreneur who wants to implement holistic agriculture must have?



(Arguments or examples are requested for these)

Synthetic notes

Thank you for helping us understand some things about your business. This information is valuable and will be useful in the development of this field of activity.

Debriefing-ul echipei de interviu după interviu

- a. Assessments regarding subjects' willingness to participate in discussions
- b. Assessments regarding the general ambience of the interview
- c. Assessments regarding mood (optimistic, pessimistic, balanced)
- d. Assessments regarding the confidence shown by the subjects of the interview
- e. Other appreciations depending on the overall impression





Appendix 4 Case studies used in FOCUS GRUP research

1. Stimulating Entrepreneurial Thinking

Case Study: In a village, a holistic agriculture initiative fails due to a lack of entrepreneurial knowledge and limited market access. Farmers are discouraged and think about abandoning holistic practices.

2. Stimulating Innovation Potential

Case Study: A group of students develops a new type of organic fertilizer but faces difficulties in testing and promoting it due to limited financial resources and local skepticism.

3. Creating Innovations in Holistic Agriculture

Case Study: Researchers discover a revolutionary pest control method, but collaboration between universities, entrepreneurs, and students is weak, hindering widespread adoption.

4. Transforming Students and Entrepreneurs into Innovators

Case Study: An entrepreneur has an innovative idea for recycling organic waste into energy, but lacks a mentorship system to guide him in developing the idea.

5. Transforming Businesses in Holistic Agriculture

Case Study: A cooperative tries to adopt holistic practices but faces resistance from members who fear change and initial investments.

6. Transforming Innovations into Growing Businesses

Case Study: In Togo, a startup launches a mobile app to connect farmers with local markets, but faces technical problems and a lack of trust from farmers.





Appendix 5

Informed Consent Form for Participation in Focus Group

Project Title: Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa

Organizers:

Date:

Location:

Purpose of the Focus Group: To explore and develop strategies for stimulating entrepreneurial thinking and innovation in holistic agriculture.

Project Description:

This focus group is part of a broader study aimed at identifying and analyzing the opportunities and challenges in holistic agriculture in Sub-Saharan Africa. The purpose of the session is to collect data and opinions from participants on various specific topics, which will be used to form recommendations and strategies within the context of the mentioned project.

Procedure: During the focus group, you will be asked to participate in group discussions led by a moderator. Discussions will be recorded in audio and/or video to ensure the accuracy of the information collected. The session is expected to last approximately [number] hours.

Confidentiality: All personal information collected during this focus group will be kept confidential. Your identity will not be disclosed in any report or publication resulting from this project, and the collected data will be presented only in aggregated or anonymized format.

Participant Rights: Your participation is voluntary, and you have the right to withdraw from the study at any time without any effect on your relationship with the organizers or the host institution.

Consent:

By signing this form, you confirm that you have understood the information presented and agree to participate in this focus group. You also agree to the audio/video recording of the discussions in which you will participate.

Contact: For any questions related to the study or your rights as a participant, you can contact [Name and contact of the data protection officer or researcher from the host institution].

Participant Signature:

Date:

Researcher/Project Manager Signature:

Date:



RAPPORT DE RECHERCHE

D1.6 - Mise à jour du rapport

d'évaluation des besoins en matière de

méthodologie d'enseignement

"Ion Ionescu De La Brad" Université des sciences de la vie de Iasi (IULS, Roumanie)



Contenu

1. PLAN GÉNÉRAL DE RECHERCHE	3
1.1 Buts et objectifs de la recherche	3
1.2 Plan méthodologique	4
1.3 Résultats et discussions	5
2. RECHERCHE PAR ENTRETIEN	6
2.1 But et objectifs de l'entretien	6
2.2 Méthodologie de recherche par entretien	6
2.3 Résultats des entretiens et discussions	8
3. RECHERCHE PAR GROUPES DE DISCUSSION	14
3.1 Buts et objectifs de la session du groupe de discussion	14
3.2 Méthodologie de recherche des groupes de discussion	14
3.3 Résultats et discussions des groupes de discussion	17
4. CONCLUSIONS	20
Annexe	24



1. PLAN GÉNÉRAL DE RECHERCHE

Dans le contexte actuel de la mondialisation, une compréhension approfondie de la dynamique entrepreneuriale est essentielle dans les établissements d'enseignement supérieur. Cette étude se concentre sur l'évaluation des besoins et des contraintes des enseignants dans l'application de méthodes d'enseignement qui stimulent la pensée entrepreneuriale et le potentiel d'innovation.

L'agriculture, secteur vital, met en évidence la nécessité d'approches innovantes telles que l'agriculture holistique, qui intègre des techniques durables et favorise l'équilibre environnemental et social.

En explorant les attitudes à l'égard de l'apprentissage entrepreneurial, l'utilisation de différentes méthodologies et la disponibilité des opportunités de formation, l'étude vise à fournir des recommandations concrètes pour améliorer les pratiques d'enseignement et l'impact de l'éducation à l'entrepreneuriat dans les institutions partenaires.

1.1 Buts et objectifs de la recherche

Ce rapport vise à mettre à jour et à élargir la compréhension des besoins et des contraintes du personnel enseignant dans les établissements d'enseignement supérieur partenaires, en se concentrant sur l'application de méthodologies qui stimulent la pensée entrepreneuriale et le potentiel d'innovation dans le secteur agroalimentaire. En analysant les attitudes des enseignants et des étudiants à l'égard de l'apprentissage entrepreneurial et de l'innovation dans l'enseignement, cette étude explore l'utilisation de diverses méthodologies pédagogiques et identifie les possibilités de formation appropriée des enseignants. Cette recherche adopte des méthodologies mixtes, notamment une analyse documentaire, des entretiens semi-structurés et des questionnaires en ligne, complétés par des sessions de groupes de discussion avec des enseignants, des étudiants et des représentants de la communauté des affaires. L'objectif est non seulement de dresser un tableau actuel du paysage de l'enseignement de l'entrepreneuriat, mais aussi de formuler des recommandations stratégiques pour le développement des compétences entrepreneuriales dans le contexte spécifique des pratiques d'enseignement innovantes et efficaces. Ces efforts sont orientés vers la modélisation de pratiques durables dans l'éducation, facilitant l'adaptation à un environnement académique et entrepreneurial changeant. Le plan de recherche comprend trois objectifs principaux adaptés au contexte de chaque institution partenaire, en mettant l'accent sur l'identification des méthodes et outils pédagogiques les plus efficaces pour répondre aux besoins spécifiques du secteur agroalimentaire.

Enfin, une évaluation approfondie des besoins et des contraintes a été réalisée et aboutira à un rapport électronique contenant des recommandations claires sur la formation des enseignants afin d'améliorer continuellement l'apprentissage entrepreneurial. Le rapport souligne l'importance d'actualiser et d'élargir la compréhension des besoins du personnel enseignant de l'enseignement supérieur, en mettant en évidence la nécessité d'intégrer des méthodologies qui promeuvent la pensée entrepreneuriale et l'innovation dans le secteur agroalimentaire. En examinant les attitudes à l'égard de l'apprentissage et de l'innovation, l'étude donne un aperçu de la diversité méthodologique et des possibilités de formation, essentielles pour s'adapter à la dynamique du marché de l'éducation. Utilisant des méthodologies de recherche mixtes, cette étude saisit à la fois les perspectives actuelles des enseignants et des étudiants, ainsi que des représentants de la communauté des affaires, en se concentrant sur l'identification des pratiques pédagogiques efficaces. L'objectif est de formuler des recommandations stratégiques pour l'amélioration des compétences entrepreneuriales qui sont essentielles pour façonner des pratiques éducatives durables et innovantes adaptées à l'environnement académique et entrepreneurial en constante évolution.

Le rapport final propose des orientations claires pour le développement des compétences entrepreneuriales dans le contexte spécifique des établissements d'enseignement supérieur partenaires. L'évaluation approfondie des besoins et des contraintes aboutit à des recommandations concrètes pour l'optimisation des méthodologies d'enseignement et de la formation des enseignants, soulignant la nécessité d'approches pédagogiques qui répondent efficacement aux défis du secteur agroalimentaire.

1.2 Plan méthodologique

La nécessité de ce plan était d'actualiser les données sur les besoins et les contraintes des enseignants de l'enseignement supérieur dans le contexte de l'application de méthodologies d'enseignement et d'apprentissage qui stimulent la pensée entrepreneuriale et l'innovation. En utilisant des méthodes de recherche innovantes, notamment des entretiens semi-structurés, des questionnaires en ligne et des sessions de groupes de discussion, l'étude vise à analyser les attitudes des enseignants, des étudiants et de la communauté des affaires à l'égard de l'apprentissage entrepreneurial dans le secteur agroalimentaire. L'objectif principal de ces activités est d'identifier et de synthétiser les défis, les opportunités et les besoins spécifiques de ces groupes, facilitant ainsi la formulation de recommandations pour la formation des enseignants. En collectant et en analysant les données, l'étude vise à élaborer un ensemble de compétences clés et à développer des stratégies adaptées aux besoins éducatifs du secteur agroalimentaire, contribuant ainsi au renforcement d'un environnement entrepreneurial solide et innovant dans les établissements d'enseignement supérieur.

Les entretiens semi-structurés, menés à la fois en ligne et en face à face, ont impliqué des entrepreneurs, des enseignants et des étudiants des établissements d'enseignement supérieur partenaires. Ils visaient à évaluer leur point de vue sur l'application de méthodologies d'enseignement et d'apprentissage qui stimulent la pensée entrepreneuriale dans le secteur agroalimentaire, en identifiant les défis et les opportunités spécifiques. Les objectifs des entretiens étaient les suivants : a. Identifier les défis rencontrés par les entrepreneurs dans l'application des concepts entrepreneuriaux. b. Évaluer les besoins des enseignants en matière de formation à des méthodologies d'enseignement innovantes. c. Mettre en évidence les obstacles rencontrés par les étudiants dans l'accès à l'enseignement de l'entrepreneuriat. Les résultats ont été résumés dans des rapports détaillant ces questions, ainsi que des recommandations pour améliorer les programmes et les méthodes d'enseignement. Les groupes de discussion avaient pour but de consolider les résultats des entretiens et des questionnaires par des discussions approfondies avec des membres de la communauté universitaire et entrepreneuriale : Le groupe de discussion 1 a mis en évidence les directions dans lesquelles un ensemble commun de compétences clés nécessaires aux enseignants pour mettre en œuvre et enseigner les principes de l'agriculture holistique devrait être développé.

Cette approche tridimensionnelle intègre l'analyse des besoins éducatifs et l'identification des compétences requises, dans le but de développer des stratégies adaptées à chaque institution partenaire. Les résultats de cette recherche visent à informer et à améliorer continuellement les pratiques d'enseignement et à contribuer à la création d'un environnement entrepreneurial solide et innovant dans l'enseignement supérieur.

La conception de la recherche a mis en lumière les besoins et les contraintes auxquels sont confrontés les enseignants de l'enseignement supérieur, en soulignant l'importance d'appliquer des méthodologies d'enseignement qui favorisent la pensée entrepreneuriale et l'innovation. L'utilisation de méthodes de recherche, notamment des entretiens semi-structurés et des groupes de discussion, a permis une analyse détaillée des attitudes des enseignants et des étudiants à l'égard de l'enseignement de l'entrepreneuriat dans le secteur agroalimentaire, fournissant ainsi une base solide pour la formulation de recommandations éducatives. Les entretiens ont mis en évidence les difficultés spécifiques rencontrées par les entrepreneurs dans l'application des concepts entrepreneuriaux, ainsi que le besoin des enseignants de se former à des méthodologies d'enseignement innovantes. Ces discussions ont permis d'identifier les obstacles auxquels les étudiants sont confrontés dans l'accès à l'enseignement de l'entrepreneuriat, soulignant ainsi le besoin urgent d'améliorer le programme et les méthodes d'enseignement pour soutenir efficacement le développement des compétences entrepreneuriales.

Les groupes de discussion ont renforcé les résultats des entretiens et des questionnaires, en facilitant des discussions approfondies sur le développement des compétences pédagogiques nécessaires dans le secteur agroalimentaire. Cette méthode collaborative a permis d'enrichir la compréhension commune des compétences clés et des orientations de développement essentielles pour les enseignants qui mettent en œuvre

les principes de l'agriculture holistique et entrepreneuriale. Ainsi, l'étude a fourni des stratégies adaptées aux besoins spécifiques de chaque institution partenaire, contribuant à l'évolution continue de l'enseignement de l'entrepreneuriat.

1.3 Résultats et discussions

L'analyse des résultats de la recherche donne un aperçu détaillé de l'application des méthodologies d'enseignement et d'apprentissage dans les universités partenaires, soulignant l'importance de l'adaptabilité, de l'innovation et de l'interdisciplinarité pour relever les défis complexes du monde moderne. Chaque méthode de recherche met en lumière différents aspects des besoins et des contraintes du personnel enseignant, en soulignant comment une approche intégrée peut améliorer les processus éducatifs et stimuler la pensée entrepreneuriale. Les résultats de la recherche montrent que l'interdisciplinarité est cruciale dans l'enseignement de l'entrepreneuriat, soulignant le besoin d'adaptabilité et de collaboration entre les différents domaines académiques afin de répondre efficacement aux défis éducatifs et sociétaux contemporains. L'interdisciplinarité est appréciée non seulement pour sa capacité à générer des solutions innovantes, mais aussi pour son rôle dans le développement de compétences transversales essentielles telles que la pensée critique et l'adaptabilité. Ces compétences sont essentielles à la réussite des enseignants et des étudiants dans un environnement académique et professionnel en constante évolution.

L'analyse souligne également le rôle crucial de l'esprit d'entreprise dans le programme d'études agroalimentaires, en insistant sur le besoin urgent pour les enseignants d'adopter des méthodologies innovantes et adaptatives. Les entrepreneurs de l'éducation et les enseignants sont encouragés à explorer et à mettre en œuvre des pratiques innovantes susceptibles de transformer le paysage éducatif agroalimentaire, en relevant les défis et en maximisant les opportunités pour le secteur. La recherche a exploré en détail comment différentes méthodologies pédagogiques influencent l'innovation et la pensée entrepreneuriale chez les enseignants et les étudiants. La dynamique des interactions et le retour d'information soulignent comment l'adaptabilité et la qualité des discussions lors des sessions d'apprentissage peuvent directement influencer la génération d'idées novatrices, applicables à l'amélioration continue des pratiques pédagogiques.

Ces résultats, issus de diverses méthodologies de recherche, illustrent la complexité et l'interdépendance des facteurs contribuant au développement professionnel et entrepreneurial dans l'enseignement supérieur. Ils soulignent la nécessité d'une approche holistique et intégrée dans l'enseignement et la recherche, montrant comment différentes perspectives peuvent contribuer à une meilleure compréhension des besoins éducatifs et à l'identification de solutions efficaces et durables pour encourager la pensée entrepreneuriale. L'analyse des résultats de la recherche souligne le rôle essentiel de l'interdisciplinarité dans l'enseignement de l'entrepreneuriat, démontrant comment l'adaptabilité et la collaboration entre les différentes disciplines universitaires sont cruciales pour répondre aux défis éducatifs et sociétaux actuels. Cette approche facilite non seulement l'innovation, mais contribue également au développement de compétences clés, telles que la pensée critique et l'adaptabilité, qui sont vitales dans un environnement universitaire et professionnel dynamique.

Les résultats de la recherche soulignent également l'importance d'intégrer l'esprit d'entreprise dans les programmes d'études agroalimentaires, en insistant sur la nécessité pour les enseignants d'adopter et de mettre en œuvre des méthodologies pédagogiques innovantes et adaptatives. Cela pourrait révolutionner le secteur de l'éducation agroalimentaire, en fournissant aux enseignants et aux étudiants les outils nécessaires pour naviguer et exploiter les opportunités émergentes de ce secteur en pleine expansion.

Grâce à ses diverses méthodologies de recherche, l'étude illustre la complexité et l'interdépendance des facteurs impliqués dans le développement des compétences professionnelles et entrepreneuriales dans les universités. L'accent mis sur une approche holistique et intégrée de la pédagogie et de la recherche souligne comment différentes perspectives peuvent améliorer la compréhension des besoins éducatifs et identifier des solutions efficaces pour stimuler la pensée innovante et entrepreneuriale.

2. RECHERCHE PAR ENTRETIEN

La conception de la recherche a permis d'évaluer l'utilisation de méthodes d'enseignement et d'apprentissage qui stimulent la pensée entrepreneuriale et le potentiel d'innovation dans l'enseignement supérieur, en mettant l'accent sur le secteur agroalimentaire. L'étude comprenait des entretiens semi-structurés avec trois groupes principaux dans différents pays : des entrepreneurs, des universitaires et des étudiants, avec plus de 30 personnes sélectionnées par pays pour refléter la diversité et la complexité du secteur. L'échantillon ciblait des entrepreneurs de tailles et de types d'entreprises différents, allant de la production agricole au commerce et aux services, ainsi que des universitaires et des étudiants dans les domaines concernés. Les entretiens visaient à identifier les attitudes des enseignants à l'égard de l'apprentissage entrepreneurial, les difficultés rencontrées dans la mise en œuvre de méthodes d'enseignement innovantes et les besoins de formation complémentaire. Cette méthode de collecte de données a permis de comprendre en profondeur les besoins et les contraintes des enseignants, ainsi que la perception de l'enseignement de l'entrepreneuriat par les étudiants et les milieux d'affaires.

Les résultats de l'étude seront analysés afin d'élaborer des recommandations spécifiques qui seront présentées dans un rapport électronique. Ces recommandations viseront à améliorer et à adapter les méthodologies d'enseignement afin d'encourager la pensée innovante et entrepreneuriale chez les étudiants, enrichissant ainsi le potentiel d'innovation de l'enseignement supérieur. Cette analyse inclut également les perspectives émergentes des jeunes, soulignant l'importance d'adapter le soutien éducatif et entrepreneurial à leurs besoins spécifiques.

2.1 But et objectifs de l'entretien

L'objectif de ces entretiens était de mettre à jour et de comprendre les compétences, les défis et les opportunités dans l'enseignement supérieur dans le contexte de la stimulation de la pensée entrepreneuriale et de l'innovation. À la lumière des changements économiques mondiaux et des pressions croissantes en faveur de la durabilité, la recherche visait à saisir les multiples perspectives des universitaires, des étudiants et de la communauté des affaires sur les méthodologies d'enseignement et d'apprentissage innovantes et entrepreneuriales.

a. Pour les entrepreneurs - les entretiens visaient à identifier les compétences entrepreneuriales clés et les défis dans le secteur agroalimentaire, en explorant comment ces compétences contribuent au développement durable et à la performance économique. L'impact des initiatives entrepreneuriales sur l'environnement socio-économique et commercial a également été étudié.

b. Pour les enseignants - l'accent a été mis sur les attitudes et les observations des enseignants concernant l'apprentissage entrepreneurial et l'innovation dans l'enseignement. La disponibilité et l'efficacité des opportunités de formation pour les enseignants, telles que les ateliers et les séminaires, visant à améliorer les approches pédagogiques axées sur l'esprit d'entreprise et l'innovation ont été analysées.

c. Pour les étudiants - la perception qu'ont les étudiants de l'apprentissage entrepreneurial et de l'innovation dans l'enseignement a été évaluée. L'étude a examiné l'impact de ces méthodes pédagogiques sur leurs aspirations entrepreneuriales et leur reconnaissance des obstacles et des opportunités dans le secteur agroalimentaire.

Les résultats obtenus contribueront à l'élaboration d'un rapport électronique contenant des recommandations spécifiques pour l'optimisation des programmes d'études et des stratégies pédagogiques dans les établissements d'enseignement supérieur, en soulignant l'importance de l'adaptation aux exigences du marché du travail et aux nouvelles tendances mondiales en matière d'éducation et d'esprit d'entreprise.

2.2 Méthodologie de recherche par entretien

La collecte des données des entretiens a été effectuée dans chaque université partenaire par 4 à 6 chercheurs spécialisés (en équipes de deux). Afin de garantir une meilleure réactivité de la part des employeurs, l'interaction en face à face a été privilégiée, soit dans leurs locaux, soit à l'université. Les étudiants et les enseignants ont été interrogés dans les locaux de l'université.

L'entretien a été mené par le biais d'une interaction directe et individuelle avec les sujets, garantissant ainsi la protection des données personnelles et l'obtention d'informations adjacentes pertinentes pour les objectifs poursuivis par le sujet de recherche.

Des guides d'entretien ont été élaborés pour aider les spécialistes de la recherche sur le terrain. Ces guides comprenaient des questions d'orientation liées aux objectifs de l'entretien et des explications sur la manière, le moment et le lieu de mener l'entretien. Les guides ont été spécifiquement adaptés à chaque catégorie de sujets : entrepreneurs, étudiants et enseignants.

L'échantillon de recherche était composé d'un minimum de 30 personnes par pays :

1. Au moins 20 entrepreneurs agroalimentaires identifiés en fonction de leur position dans la chaîne d'approvisionnement agroalimentaire et de leur taille économique :

- Production agricole (légumes, bétail, volaille, abeilles, poissons, fermes maraîchères, fruitières, etc :)
 - Au moins un entrepreneur possédant une grande exploitation agricole ;
 - Au moins 2 entrepreneurs ayant des exploitations de taille moyenne ;
 - Au moins 4 entrepreneurs ayant une petite exploitation ;
- Transformation de produits agricoles (ateliers et usines de transformation du lait, de la viande, des légumes, des fruits, etc :)
 - Au moins un entrepreneur d'une grande entreprise ;
 - Au moins deux entrepreneurs ayant des entreprises de taille moyenne ;
 - Au moins 4 entrepreneurs possédant de petites entreprises ;
- Commerce et autres services (magasins, restaurants, hôtels, etc.)
 - Au moins un entrepreneur à la tête d'une grande entreprise ;
 - Au moins 2 entrepreneurs possédant des entreprises de taille moyenne ;
 - Au moins 4 entrepreneurs propriétaires de petites entreprises ;

2. Au moins 5 professeurs d'université spécialisés dans la technologie agroalimentaire, l'économie agroalimentaire, le droit, le marketing, la sécurité alimentaire ou d'autres domaines spécifiques au secteur agroalimentaire dans le pays partenaire ;

3. Un minimum de 5 étudiants en dernière année de spécialisation agroalimentaire, dont un étudiant de l'agriculture, de l'industrie alimentaire, du commerce et d'autres secteurs de services.

Cet échantillon a été considéré comme pertinent par rapport aux objectifs de l'entretien parce que

- Les entrepreneurs des trois maillons de la chaîne d'approvisionnement agroalimentaire sont conscients des enjeux de l'environnement entrepreneurial et des compétences nécessaires dans ce domaine ;
- Les enseignants disposent d'informations fondées sur la recherche universitaire concernant le secteur agroalimentaire et les compétences nécessaires à l'emploi et à l'entrepreneuriat dans ce secteur ;
- Les étudiants peuvent apporter un regard neuf sur les défis et les opportunités du secteur, les tendances émergentes, les besoins éducatifs et les aspirations professionnelles.

La petite taille de l'échantillon était justifiée par la participation à une phase préliminaire de la recherche, et la représentativité de l'échantillon a été assurée par la couverture d'une variété de secteurs agroalimentaires. La structure de l'échantillon était indicative et permettait des changements de 10 à 20 % dans chaque catégorie, en fonction de la pertinence d'une dimension particulière dans le pays ou de la nécessité d'introduire un autre maillon dans la chaîne d'approvisionnement agroalimentaire.

Au début de l'entretien, les sujets ont été informés des réponses demandées et de la manière dont elles seraient utilisées, en veillant à ce que les informations recueillies soient publiées sans identification de leurs données personnelles. Il leur a également été demandé de consentir à l'utilisation de ces informations.

L'entretien était semi-structuré et les questions du guide d'entretien étaient indicatives, permettant aux enquêteurs d'adapter les questions pour obtenir les informations les plus pertinentes. Le guide d'entretien a été traduit dans la langue locale de chaque partenaire.

Transmission des résultats

Les réponses des personnes interrogées ont été notées sous forme de résumé au moment de l'entretien et complétées à la fin de la journée d'entretien lors de la séance de débriefing. Les rapports qui en résultent constituent la base de l'analyse de l'entretien.

Les formulaires du guide d'entretien, traduits en anglais, ont été envoyés sous forme numérique à des collègues de l'IULS pour analyse et interprétation (annexe 1). Les noms des sujets et des enquêteurs ont été codés par l'équipe de recherche partenaire. Les formulaires codés ont été renvoyés à l'équipe de l'IULS.

Le processus de traitement des données de cette recherche a été rigoureux et structuré afin de garantir l'exactitude et la pertinence des informations recueillies lors des entretiens. Tout d'abord, les données ont été collectées par des équipes de chercheurs spécialisés qui ont interrogé les sujets en face à face, soit à leur domicile, soit à l'université, en fonction de la catégorie de participants. Cette méthode de face-à-face a non seulement permis une meilleure compréhension des réponses, mais a également facilité la collecte d'informations détaillées spécifiques aux objectifs de la recherche.

Après la collecte des données, les réponses ont été notées sous forme de résumé, puis détaillées lors de séances de débriefing à la fin de la journée d'entretien, ce qui a permis une évaluation immédiate et contextualisée des informations obtenues. Pour garantir la confidentialité, les noms des sujets et des enquêteurs ont été codés avant que les formulaires du guide d'entretien, traduits en anglais, ne soient envoyés à des collègues de l'IULS pour une analyse et une interprétation plus approfondies.

Cette dernière étape a consisté en une analyse approfondie des données, au cours de laquelle les chercheurs de l'IULS ont évalué et interprété les informations afin de tirer des conclusions significatives et de recommander des orientations futures pour la recherche et l'action. Ce processus de traitement des données a permis de garantir non seulement l'intégrité scientifique de la recherche, mais aussi l'applicabilité et la pertinence des résultats dans le contexte réel du secteur agroalimentaire étudié.

Le traitement et l'analyse rigoureux des données ont garanti l'exactitude et la pertinence des informations, permettant aux chercheurs de tirer des conclusions significatives et de proposer des pistes d'action. Le codage des noms et des détails personnels a assuré la confidentialité tout en respectant l'éthique de la recherche, tandis que l'utilisation de la technologie numérique a facilité une collaboration efficace entre les équipes de recherche.

En conclusion, la méthodologie méticuleuse utilisée dans cette recherche a mis en évidence l'importance d'adapter les méthodes de collecte et d'analyse des données aux spécificités de chaque secteur étudié. Les résultats obtenus constituent une base solide pour le développement futur des pratiques éducatives et entrepreneuriales dans les universités partenaires, contribuant ainsi à accroître la capacité d'innovation et d'adaptation face aux changements dans la dynamique du secteur agroalimentaire.

2.3 Résultats des entretiens et discussions

Dans un paysage économique mondial en constante évolution, les entrepreneurs sont confrontés à des défis et à des opportunités dynamiques qui façonnent la manière dont les affaires sont menées. L'objectif de cette synthèse est d'explorer et d'actualiser les données sur les besoins et les contraintes du personnel de l'enseignement supérieur, en mettant l'accent sur les méthodes d'enseignement et d'apprentissage qui stimulent la pensée entrepreneuriale et le potentiel d'innovation. Elle examine les attitudes des universitaires, la disponibilité des possibilités de formation et les points de vue de la communauté des affaires dans le contexte de l'enseignement supérieur, offrant ainsi une perspective précieuse sur l'intégration de l'éducation à l'esprit d'entreprise dans les programmes universitaires.

Section 1 : Contexte économique et innovations

Malgré un climat économique souvent volatile, caractérisé par l'inflation, l'augmentation des coûts de production et la fluctuation de la demande du marché, les entrepreneurs du Kenya, du Nigeria et du Togo font état d'un certain nombre d'adaptations stratégiques qui leur ont permis non seulement de survivre, mais aussi de prospérer. Au Kenya, l'accent mis sur l'innovation technologique a permis à de nombreuses entreprises agroalimentaires d'améliorer l'efficacité de leur production. L'utilisation de technologies avancées, telles que les systèmes d'irrigation automatisés et les techniques agricoles modernes, a permis d'optimiser les ressources et de réduire le gaspillage.

Au Nigeria, les entrepreneurs du secteur alimentaire ont fait état d'une augmentation de leurs revenus, attribuant leur succès à une adaptation rapide aux préférences des consommateurs et à l'expansion des points de vente. Cette capacité d'adaptation se traduit par l'ouverture de nouveaux restaurants et points de vente de restauration rapide dans les zones urbaines, où la demande augmente en raison de l'urbanisation accélérée.

Au Togo, les défis économiques ont été relevés grâce à des stratégies visant à diversifier les produits et à explorer de nouveaux marchés. Par exemple, les entrepreneurs agricoles ont investi dans des cultures alternatives moins vulnérables aux fluctuations du marché, telles que les plantes médicinales et aromatiques, qui sont très demandées à la fois localement et sur les marchés internationaux.

Section 2 : Environnement et changement climatique

L'impact du changement climatique est une préoccupation constante pour les entrepreneurs des trois pays. Au Kenya, où l'agriculture dépend fortement des conditions climatiques, les entrepreneurs ont signalé des pertes importantes dues à des sécheresses prolongées. En réponse, de nombreuses entreprises ont investi dans des technologies de collecte et de stockage de l'eau et dans des semences tolérantes à la sécheresse afin de garantir la durabilité de la production.

Le Nigeria est confronté à des problèmes similaires, en particulier dans les régions où l'agriculture est dominante. Dans ces régions, les entrepreneurs ont adopté des stratégies telles que la rotation des cultures et l'agriculture de précision afin de minimiser l'impact négatif des changements environnementaux sur la production. Ces pratiques permettent non seulement d'améliorer l'efficacité de l'utilisation des ressources, mais aussi de préserver la biodiversité et de réduire l'érosion des sols.

Au Togo, où l'accès à l'eau potable et à l'eau d'irrigation est souvent limité, les entrepreneurs ont exploré des solutions innovantes telles que les systèmes d'irrigation solaire et la collecte des eaux de pluie. Ces initiatives ont non seulement permis d'atténuer les effets de la sécheresse, mais aussi d'ouvrir la voie à des pratiques agricoles plus respectueuses de l'environnement et plus rentables à long terme.

Section 3 : Dynamiques sociales et démographiques

Les changements démographiques ont un impact profond sur la façon dont les entrepreneurs gèrent leurs entreprises. Dans les trois régions, la baisse des taux de natalité et la migration vers les villes ont créé de nouveaux défis et de nouvelles opportunités. Au Kenya et au Togo, par exemple, la migration des jeunes vers les villes a entraîné une pénurie de main-d'œuvre dans les zones rurales, obligeant les entrepreneurs à automatiser les processus et à offrir de meilleures conditions pour attirer et retenir les travailleurs. Au Nigeria, l'urbanisation a entraîné une augmentation de la demande de produits et de services dans les villes, ouvrant ainsi de nouveaux marchés aux entrepreneurs.

Compétences, contraintes et innovation : Une analyse de l'enseignement supérieur dans l'agriculture africaine

Dans le contexte de la mondialisation et de l'économie de la connaissance, les universités africaines doivent développer des compétences qui répondent aux besoins du marché du travail et favorisent l'innovation et l'esprit d'entreprise. La présente recherche analyse les données relatives aux besoins et aux contraintes du personnel et des étudiants universitaires.

Des entretiens avec plus de 300 étudiants en agroalimentaire, en sécurité alimentaire et en vulgarisation agricole ont fourni des données précieuses sur leurs expériences éducatives et professionnelles.



Les entretiens ont été structurés autour de six thèmes principaux : expériences éducatives, forces et faiblesses, perceptions de l'apprentissage entrepreneurial, opportunités et contraintes, et retour d'information sur les méthodes d'enseignement.

Expériences éducatives et professionnelles

Kenya : Les étudiants apprécient les programmes d'échanges internationaux et soulignent l'impact positif de l'exposition aux nouvelles technologies et pratiques agricoles. Un étudiant a commenté : "L'expérience en Allemagne m'a ouvert les yeux sur les méthodes d'agriculture durable qui peuvent être appliquées dans mon pays".

Nigeria : En mettant l'accent sur l'intégration de la technologie dans l'éducation, les étudiants participent activement à des projets de recherche utilisant les technologies numériques et d'IA pour optimiser la production agricole.

Togo : Les stages constituent un lien important entre la théorie apprise en classe et la pratique agricole, les étudiants faisant état d'une meilleure compréhension des défis du monde réel dans l'agriculture.

Innovation dans l'enseignement et les méthodologies

Les différences régionales mettent en évidence une variation dans l'utilisation de méthodes d'enseignement innovantes. Au Kenya, les simulations et les jeux de rôle sont davantage utilisés en classe, tandis qu'au Togo, l'accent est mis sur les méthodes traditionnelles, ce qui souligne le besoin de ressources pour soutenir la transition vers des méthodes plus interactives.

Opportunités et contraintes

Opportunités : Les programmes de mentorat et les incubateurs sont considérés comme essentiels pour soutenir l'esprit d'entreprise des étudiants. Les étudiants du Nigeria ont davantage accès à ces ressources que ceux du Togo.

Contraintes : Le financement inadéquat et l'accès limité à la technologie sont des problèmes communs aux trois pays. Les étudiants suggèrent que des partenariats plus étroits avec l'industrie pourraient contribuer à atténuer ces contraintes.

Les recommandations portent sur l'amélioration des infrastructures éducatives et le soutien à l'innovation dans les universités :

- Développement des infrastructures - Il est essentiel de moderniser les laboratoires et les salles de classe pour soutenir la technologie et les méthodes d'enseignement fondées sur la recherche.
- Partenariats avec l'industrie Développer la collaboration avec les entreprises du secteur agroalimentaire pour faciliter les stages et les projets de recherche appliquée.
- Programmes de mentorat Mettre en œuvre des programmes de mentorat dirigés par des experts et des entrepreneurs ayant réussi afin de guider les étudiants dans le développement de leurs compétences entrepreneuriales.

Cette analyse détaillée répond non seulement aux objectifs de la recherche, mais fournit également une base solide pour les futures stratégies éducatives visant à promouvoir l'innovation et l'esprit d'entreprise parmi les étudiants de l'enseignement supérieur dans les trois pays africains analysés.

L'enseignement de l'entrepreneuriat et l'innovation dans l'enseignement supérieur sont devenus des impératifs mondiaux dans le contexte économique et social actuel. Les universités du Kenya, du Nigeria et du Togo, représentées par les voix des universitaires interrogés, reflètent une diversité de perspectives et de défis dans la mise en œuvre de ces approches éducatives. Ce rapport vise à analyser et à comparer leurs attitudes et leurs perceptions, en fournissant une base pour comprendre les besoins et les contraintes spécifiques de chaque région.



L'analyse est basée sur les réponses recueillies par le biais d'entretiens structurés dans trois pays africains différents. Les données ont été interprétées à l'aide d'une analyse thématique afin d'identifier et de comparer les principales tendances et différences dans les perceptions de l'apprentissage entrepreneurial et de l'innovation pédagogique.

Kenya : Les enseignants manifestent un intérêt croissant pour les méthodes d'enseignement interactives et centrées sur l'étudiant. L'adaptabilité du programme d'études à la dynamique du marché du travail et aux besoins des étudiants en matière d'esprit d'entreprise constitue un point fort. Toutefois, les défis à relever sont les ressources limitées et la nécessité d'un plus grand soutien du gouvernement et de l'industrie pour les initiatives éducatives novatrices.

Nigeria : Les enseignants soulignent une prise de conscience accrue de l'importance de l'éducation à l'esprit d'entreprise comme moyen de lutter contre le chômage des jeunes. Les méthodes utilisées comprennent des études de cas réels et le parrainage de jeunes entreprises. Les principaux obstacles sont l'insuffisance des infrastructures éducatives et les fluctuations politiques qui affectent le financement et la stabilité des programmes éducatifs.

Togo : Les réponses des enseignants soulignent les initiatives récentes du gouvernement pour soutenir l'innovation dans l'enseignement supérieur. Le développement des compétences entrepreneuriales chez les étudiants, encouragé par les nouvelles politiques éducatives et les partenariats avec le secteur privé, fait l'objet d'un optimisme prudent. Cependant, les inégalités régionales et l'accès limité à la technologie sont cités comme des obstacles importants.

Dans les trois pays, il existe un consensus sur le fait que la formation à l'entrepreneuriat peut servir de catalyseur pour le développement économique et personnel. Toutefois, la manière dont chaque pays aborde ce domaine varie en fonction du contexte socio-économique et politique. La promotion de l'innovation et de l'esprit d'entreprise est considérée comme essentielle dans la formation des futurs chefs d'entreprise et innovateurs.

Les universités et les décideurs politiques du Kenya, du Nigeria et du Togo doivent travailler ensemble pour surmonter les obstacles systémiques et intégrer efficacement l'enseignement de l'entrepreneuriat et de l'innovation dans l'enseignement supérieur. L'investissement dans la technologie, la formation des enseignants et des partenariats étroits avec l'industrie sont essentiels pour garantir que l'enseignement de l'entrepreneuriat réalise son plein potentiel afin d'avoir un impact positif sur les économies nationales et de doter les étudiants des compétences nécessaires pour le marché mondial dynamique.

Dans cet aperçu des entretiens, nous explorons les diverses perspectives offertes par les praticiens et les théoriciens de l'aquaculture, de l'agriculture, de l'économie et des sciences sociales. Ils soulignent comment l'interdisciplinarité et la collaboration entre les domaines peuvent conduire à des solutions innovantes et durables qui sont essentielles pour relever les défis contemporains tels que le changement climatique, la volatilité des marchés et les pressions sociales. Ce texte vise donc à montrer comment les compétences transversales, telles que la pensée critique et l'adaptabilité, sont essentielles dans l'apprentissage tout au long de la vie et le développement de carrière afin de mieux préparer les individus à un avenir incertain et changeant.

Interdisciplinarité et adaptabilité

L'analyse met en évidence un lien étroit entre les différents domaines d'études et la pratique professionnelle, tels que l'aquaculture, l'agriculture, l'économie et les sciences sociales. Cette interdisciplinarité souligne la nécessité d'une approche adaptable et flexible des carrières, ainsi que l'importance de compétences transversales telles que la pensée critique et l'innovation. Par exemple, les entrepreneurs du secteur de l'aquaculture et de la pêche soulignent la nécessité de s'adapter aux nouvelles technologies et méthodes pour accroître l'efficacité, tandis que les étudiants insistent sur l'importance de l'expérience pratique, comme les programmes de formation industrielle, pour améliorer leurs compétences et les préparer au marché du travail.



Durabilité et responsabilité sociale

Un certain nombre de répondants soulignent l'importance de la durabilité et de la responsabilité sociale dans leurs activités, qu'il s'agisse de développer des cultures résistantes à la sécheresse ou de gérer les ressources de manière à minimiser l'impact sur l'environnement. Cette préoccupation pour la durabilité reflète une prise de conscience croissante de l'impact à long terme des pratiques agricoles et commerciales, ainsi qu'une reconnaissance du rôle qu'elles peuvent jouer pour relever les défis mondiaux tels que le changement climatique et la sécurité alimentaire.

Faire face aux incertitudes et aux défis mondiaux

Les thèmes décrivent différentes stratégies pour faire face aux incertitudes et aux défis mondiaux tels que le changement climatique, la volatilité des marchés et l'accès limité aux ressources. Il s'agit notamment de développer de nouvelles compétences, telles que des connaissances avancées en génétique pour développer des variétés de cultures résistantes, ou de s'adapter à de nouvelles méthodes de marketing et de communication, y compris l'utilisation des médias sociaux pour atteindre des publics plus larges. Pour relever ces défis, il faut combiner connaissances techniques, compétences sociales et capacité d'adaptation, ce qui souligne l'importance d'une éducation qui prépare les étudiants et les professionnels à un paysage en évolution rapide.

Développement des compétences et apprentissage tout au long de la vie

Les personnes interrogées soulignent la nécessité d'un développement continu des compétences, à la fois techniques et non techniques, pour rester pertinent sur un marché du travail en constante évolution. Cela inclut, par exemple, les compétences en matière de communication et de travail en équipe, que plusieurs répondants ont identifiées comme essentielles pour réussir dans leur domaine, ainsi que les compétences technologiques avancées nécessaires pour innover et améliorer les processus de production. Cela souligne l'importance des programmes d'éducation et de formation qui fournissent une base de connaissances solide mais encouragent également l'apprentissage tout au long de la vie.

Résilience et optimisme face aux défis

Malgré les défis identifiés, les réponses des personnes interrogées témoignent d'un fort sentiment de résilience et d'optimisme. Cela se traduit par une ambition d'explorer de nouvelles opportunités, une capacité à s'adapter au changement et un désir de faire une différence positive dans leurs communautés. La confiance et l'optimisme exprimés par les sujets face à l'incertitude suggèrent une forte volonté de surmonter les obstacles et de contribuer à la construction d'un avenir meilleur, à la fois pour eux-mêmes et pour la société dans son ensemble.

L'attitude des enseignants à l'égard de l'apprentissage entrepreneurial est donc fortement influencée par la dynamique économique actuelle. Au Kenya, au Nigeria et au Togo, les enseignants reconnaissent la nécessité d'adapter le programme aux réalités économiques et technologiques. L'utilisation de technologies avancées et l'adaptation rapide aux demandes du marché sont considérées comme essentielles pour préparer les étudiants à l'esprit d'entreprise et à contribuer à la prospérité des entreprises agricoles grâce à l'innovation et à l'efficacité.

Le changement climatique est une préoccupation majeure et les réponses des enseignants montrent qu'ils reconnaissent la nécessité d'intégrer des pratiques durables dans l'éducation. Au Kenya, l'investissement dans les technologies d'économie d'eau et les semences résistantes à la sécheresse est considéré comme essentiel pour assurer la durabilité et adapter l'éducation aux conditions environnementales changeantes, ce qui est également pertinent pour le programme d'études universitaires.

L'évolution démographique et l'urbanisation influencent la manière dont la formation à l'entrepreneuriat est perçue et mise en œuvre. Les éducateurs du Kenya et du Togo notent les défis posés par la pénurie de main-d'œuvre dans les zones rurales et reconnaissent la nécessité d'adapter les méthodes



d'enseignement pour attirer et retenir les jeunes dans le secteur agricole en leur offrant une formation appliquée et pertinente.

Les expériences éducatives et professionnelles des étudiants soulignent l'importance de l'exposition internationale et de l'intégration de la technologie dans le programme d'études. Les éducateurs soulignent l'impact positif des programmes d'échange et de l'utilisation des nouvelles technologies, telles que l'intelligence artificielle, pour renforcer les compétences entrepreneuriales des étudiants.

Les méthodes utilisées vont des simulations et des jeux de rôle au Kenya aux méthodes traditionnelles au Togo. Les enseignants reconnaissent le besoin de ressources pour soutenir la transition vers des méthodes d'enseignement plus interactives et centrées sur l'étudiant, qui stimulent la pensée critique et la créativité.

L'accès aux programmes de mentorat et aux pépinières d'entreprises varie d'une région à l'autre. Au Nigeria, les enseignants et les étudiants bénéficient de plus de ressources, tandis qu'au Togo, le manque de financement et l'accès limité à la technologie sont considérés comme des obstacles majeurs au développement de l'enseignement de l'entrepreneuriat.

Les recommandations des enseignants incluent le développement de partenariats étroits avec l'industrie pour faciliter les stages et les projets de recherche appliquée. Ces collaborations sont essentielles pour relier la théorie à la pratique et pour fournir aux étudiants une expérience du monde réel qu'ils pourront utiliser plus tard dans leur carrière d'entrepreneur.

Les réponses des enseignants soulignent l'importance du développement continu des compétences techniques et non techniques. Les programmes de formation devraient promouvoir l'apprentissage tout au long de la vie et veiller à ce que les étudiants soient préparés à un marché du travail dynamique et changeant.

Les préoccupations relatives à la durabilité et à la responsabilité sociale sont souvent citées par les enseignants qui considèrent l'éducation à l'entrepreneuriat comme un moyen de relever les défis mondiaux tels que le changement climatique et la sécurité alimentaire. L'enseignement doit refléter cet engagement en faveur de pratiques durables et éthiques.

Un fort sentiment de résilience et d'optimisme se dégage des réponses des enseignants, soulignant le désir de surmonter les défis et de contribuer à la construction d'un avenir meilleur. Cet état d'esprit est essentiel pour former des chefs d'entreprise et des innovateurs capables de naviguer avec succès dans le paysage économique et social mondial.

3. RECHERCHE PAR GROUPES DE DISCUSSION

La conception de la recherche a utilisé la méthode du groupe de discussion pour mettre à jour les données sur les besoins et les contraintes des enseignants de l'enseignement supérieur dans l'utilisation de méthodologies d'enseignement et d'apprentissage qui favorisent la pensée entrepreneuriale et le potentiel d'innovation. Les objectifs étaient d'analyser les attitudes des enseignants et des chercheurs à l'égard de l'apprentissage entrepreneurial et de l'innovation dans l'enseignement et l'utilisation de différentes méthodologies dans les universités partenaires au Kenya, au Nigeria et au Togo. La disponibilité d'opportunités de formation pour les enseignants et les perceptions des enseignants, des étudiants et de la communauté des affaires sur l'apprentissage entrepreneurial ont également été évaluées.

Dans chaque groupe de discussion, les discussions ont été animées par des experts qui ont guidé les enseignants dans l'évaluation et l'analyse des solutions proposées pour améliorer les méthodes d'enseignement. Des études de cas ont été utilisées pour illustrer les défis spécifiques auxquels les enseignants sont confrontés dans la promotion de la pensée entrepreneuriale et de l'innovation. Les participants, y compris les enseignants et les chercheurs, ont joué différents rôles dans des simulations de scénarios pertinents pour l'enseignement supérieur, contribuant ainsi à la génération de données qualitatives essentielles pour le rapport final avec des recommandations pour la formation des enseignants.

3.1 Buts et objectifs de la session du groupe de discussion

La recherche par groupe de discussion visait à mettre à jour les données sur les besoins et les contraintes des enseignants de l'enseignement supérieur dans l'utilisation de méthodes d'enseignement et d'apprentissage qui favorisent la pensée entrepreneuriale et le potentiel d'innovation. La participation d'un groupe diversifié d'éducateurs, comprenant des professeurs, des chercheurs et des entrepreneurs, a permis d'obtenir des perspectives et des solutions variées sur l'innovation dans l'enseignement et l'utilisation de différentes méthodologies.

- Les objectifs de la session étaient les suivants
- identifier les besoins et les contraintes des enseignants dans l'utilisation de méthodologies qui stimulent la pensée entrepreneuriale.
- évaluer les attitudes des enseignants à l'égard de l'apprentissage entrepreneurial et de l'innovation dans l'enseignement.
- analyser les possibilités de formation offertes aux enseignants pour améliorer leurs méthodes d'enseignement.
- recueillir les réactions des enseignants, des étudiants et de la communauté des affaires sur l'efficacité et l'impact de l'apprentissage entrepreneurial.
- formuler des recommandations pour améliorer la formation des enseignants sur la base de l'évaluation des besoins.

Les résultats de la recherche sont nécessaires à la formulation d'un rapport électronique contenant des recommandations pour la formation des enseignants, qui contribue de manière significative à l'amélioration des pratiques d'enseignement et à la stimulation de l'innovation et de l'esprit d'entreprise dans les établissements d'enseignement supérieur concernés. Cette méthodologie a permis un échange efficace d'idées et a contribué au développement de stratégies pratiques pour la mise en œuvre d'innovations pédagogiques...

3.2 Méthodologie de recherche par groupe de discussion

La recherche en groupe, intitulée "Entrepreneuriat en agroforesterie holistique", visait à recueillir des données qualitatives auprès de professeurs et de chercheurs d'universités du Kenya, du Nigeria et du Togo. Les participants ont assisté à des sessions individuelles organisées dans chaque pays, à raison d'une dizaine de personnes par session. Les discussions étaient structurées sous forme de jeux de rôle impliquant des acteurs



clés du secteur agroalimentaire holistique, tels que des entrepreneurs, des exportateurs, des représentants d'organisations de soutien, des enseignants, des chercheurs, des banquiers et des consommateurs. L'objectif principal de ces discussions était d'explorer les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale et le potentiel d'innovation dans l'agriculture holistique.

Cette réunion s'est tenue dans les locaux du coordinateur du projet dans le cadre de la réunion de toutes les équipes impliquées dans le projet.

Les participants : Professeurs et chercheurs de deux universités au Kenya, au Nigeria et au Togo.

Sessions individuelles par pays (environ 10 personnes).

Discussions par jeux de rôle avec des acteurs clés des systèmes agroalimentaires holistiques :

Rôles

1. entrepreneur agroalimentaire
2. exportateur/importateur de produits agroalimentaires
3. Représentant d'une organisation soutenant les entrepreneurs agroalimentaires
4. ministère de l'agriculture
5. l'enseignant et le chercheur
6. banquier
7. Consommateur

Pour chaque objectif, une étude de cas a été imaginée, décrivant un événement négatif qui crée un problème pertinent pour chaque objectif.

Le jeu de rôle se déroulera sous la forme suivante : chaque participant devra dire aux autres comment il pourrait contribuer à résoudre le problème (1 minute/chacun), puis les autres participants pourront proposer de corriger ces solutions (5 minutes). Les solutions corrigées ont été envoyées par chaque membre, pour le rôle qu'il a joué, au groupe whatsapp.

Scénario de groupe

L'esprit d'entreprise dans l'agroalimentaire holistique

Ce scénario de groupe est conçu pour recueillir des données qualitatives auprès d'un groupe diversifié de participants impliqués dans le secteur de l'agro-industrie holistique, notamment des enseignants, des chercheurs, des entrepreneurs, des banquiers et des représentants du gouvernement du Kenya, du Nigeria et du Togo. L'objectif est d'explorer les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale et le potentiel d'innovation dans l'agriculture holistique, en mettant l'accent sur la création d'innovations et leur transformation en entreprises prospères.

Pour chaque pays, une section de recherche distincte sera menée dans différentes salles avec l'aide des facilitateurs suivants :

Section A Focus Group Entrepreneuriat dans l'agro-industrie holistique au Kenya - Modératrice Oana Coca

Section B Focus Group Entrepreneuriat dans l'agroalimentaire holistique au Togo - Modérateur Dan Bodescu

Section A Groupe de discussion sur l'entrepreneuriat agroalimentaire holistique au Nigeria - Modérateur : Florin Lipşa

Déroulement des sessions

Pour chaque objectif, une étude de cas sera développée pour illustrer un défi spécifique. Les participants joueront le rôle d'un secteur agroalimentaire holistique afin de proposer et de critiquer des solutions à ces défis.

1. Stimuler l'esprit d'entreprise

Étude de cas : Dans un village, une initiative d'agriculture holistique échoue en raison du manque de compétences entrepreneuriales et de l'accès limité aux marchés. Les agriculteurs se découragent et envisagent d'abandonner les pratiques holistiques.

2. Stimuler le potentiel d'innovation

Étude de cas : Un groupe d'étudiants développe un nouveau type d'engrais organique, mais éprouve des difficultés à le tester et à le promouvoir en raison de ressources financières limitées et du scepticisme de la population locale.

3. Créer l'innovation dans l'agriculture holistique

Étude de cas : Des chercheurs découvrent une méthode révolutionnaire de lutte contre les parasites, mais la collaboration entre les universités, les entrepreneurs et les étudiants est faible, ce qui empêche une adoption à grande échelle.

4. Transformer les étudiants et les entrepreneurs en innovateurs

Étude de cas : Un entrepreneur a une idée novatrice pour recycler les déchets organiques en énergie, mais il ne dispose pas d'un système de mentorat pour l'aider à développer son idée.

5. Transformation des entreprises dans l'agriculture holistique

Étude de cas : Une coopérative tente d'adopter des pratiques holistiques, mais se heurte à la résistance des membres qui craignent le changement et l'investissement initial.

6. Transformer l'innovation en une activité en pleine croissance

Étude de cas : Une start-up lance une application mobile pour connecter les agriculteurs aux marchés locaux, mais elle est confrontée à des problèmes techniques et à un manque de confiance de la part des agriculteurs.

Conduite du jeu de rôle

Pour chaque étude de cas

1 - Les participants disposeront d'une minute chacun pour présenter et motiver leurs solutions dans le cadre d'un jeu de rôle.

2 - Après la présentation, les autres participants auront l'occasion de suggérer des ajustements ou des critiques constructives sur les solutions présentées.

3 - Chaque participant enverra les solutions adaptées au groupe WhatsApp dédié, où les discussions pourront se poursuivre en dehors des sessions du groupe de discussion.

En conclusion, le scénario du groupe de discussion "Entrepreneuriat dans l'agro-industrie holistique" fournit une plate-forme interactive et participative pour identifier et résoudre des problèmes spécifiques dans le secteur agro-alimentaire. Grâce à des jeux de rôle et des études de cas, les participants peuvent proposer et critiquer des solutions de manière constructive et collaborative. Ces sessions facilitent l'échange d'idées et de bonnes pratiques, contribuant au développement de stratégies efficaces pour stimuler l'innovation et la transformation des entreprises dans l'agriculture holistique. Les discussions et les solutions générées dans ces groupes de discussion sont documentées et partagées dans des groupes WhatsApp dédiés, garantissant un dialogue et une collaboration continus entre les participants après la fin des sessions.

Vie privée et protection des données

Afin de garantir la transparence et la protection des données personnelles dans nos groupes de discussion, chaque participant est informé de la manière dont les informations collectées seront utilisées et protégées.

Les participants ont été invités à signer un formulaire de consentement éclairé avant le début des discussions, qui détaillait l'objectif de la collecte de données, la manière dont les données seraient utilisées et leurs droits en vertu de la législation applicable en matière de protection des données.

Toutes les données personnelles sont restées strictement confidentielles, sécurisées et accessibles uniquement à l'équipe de recherche autorisée. Les enregistrements audio et vidéo ont été utilisés uniquement pour documenter et analyser les informations discutées et n'ont pas été publiés ou distribués sans le

consentement explicite des participants. L'identité des participants restera anonyme dans tous les rapports et publications résultant de ces sessions.

À la fin de l'étude, toutes les données personnelles seront supprimées ou archivées conformément aux exigences légales afin de garantir la protection et la confidentialité à long terme. Nous nous engageons à respecter et à protéger la vie privée de chaque participant et à veiller à ce que tous les processus de collecte et d'analyse des données soient menés conformément aux normes éthiques et juridiques les plus strictes. Pour toute question ou clarification concernant le traitement des données personnelles, les participants peuvent contacter notre délégué à la protection des données à l'adresse dan.bodescu@iuls.ro.

Afin d'organiser efficacement les sessions des groupes de discussion, les aspects logistiques suivants ont dû être pris en compte :

Lieu : Réserver des salles appropriées à SEKU et JOOUST, aménagées pour faciliter les discussions de groupe, de préférence avec des tables rondes ou en U pour encourager l'interaction.

Matériel technique : Projecteurs et écrans, enregistreurs audio.

Porte-noms : Pour faciliter l'identification des participants et la communication.

Invitations et confirmations : Envoi des invitations en temps utile (voir le modèle en annexe du présent document) et suivi des confirmations de présence.

3.3 Résultats et discussions des groupes de discussion

Dans le but d'évaluer la dynamique et l'efficacité de la méthodologie des groupes de discussion dans le contexte du développement socio-économique, ce document vise à explorer et à identifier les aspects critiques et les résultats d'un groupe de discussion. Cette étude se concentre sur une interprétation minutieuse et détaillée des réponses des participants sur la base des objectifs fixés, en fournissant des informations précieuses sur la dynamique du groupe, la qualité des discussions, le retour d'information spécifique au rôle, les innovations et les solutions proposées, les défis rencontrés et les recommandations d'amélioration.

Ces analyses sont fondamentales pour comprendre comment les interactions entre les participants et la structure des sessions de groupes de discussion peuvent influencer la génération d'idées innovantes et applicables ayant un impact direct sur la politique et la pratique dans les pays en développement. Dans un effort pour fournir une plateforme pour des analyses approfondies et des discussions pertinentes, ce document vise à servir de catalyseur pour l'amélioration continue des méthodologies de recherche qualitative, dans le but ultime d'optimiser leur contribution au développement durable et à la promotion du bien-être collectif dans les régions cibles.

1. Dynamique de groupe :

Niveau de participation et d'engagement : La participation active et l'engagement des membres ont été élevés, reflétant la sélection efficace des participants au projet. Cela suggère que les critères de sélection étaient appropriés aux objectifs du groupe.

Conflits et synergies : La présence d'énergies positives indique une dynamique de groupe constructive, même s'il y a eu des moments de contradiction. Bien que ces derniers puissent sembler contre-productifs, ils sont en fait essentiels dans un groupe de discussion car ils stimulent la discussion et encouragent la pensée critique et les solutions innovantes.

Interactions : Le respect des rôles attribués et l'interaction active avec l'animateur suggèrent que la méthodologie du jeu de rôle a été efficace, facilitant une communication effective et une implication profonde de tous les participants.

2. Qualité des discussions :

Profondeur et pertinence : Les discussions ont été caractérisées par une grande profondeur et une grande pertinence, ce qui indique une bonne préparation des participants et une structure bien pensée des études de cas.



Nouveaux arguments : L'accent mis sur le rôle du gouvernement dans la stimulation de l'innovation et de l'esprit d'entreprise montre une conscience claire de la nécessité de politiques de soutien, reflétant une compréhension mûre du système économique et social dont les participants font partie.

Domaines de difficulté : Les difficultés rencontrées dans certaines études de cas soulignent la nécessité de clarifier davantage les rôles et les responsabilités et suggèrent que les instructions du scénario pourraient être améliorées lors des prochaines sessions.

3. Retour d'information spécifique au rôle :

Approche par scénario : le rôle de l'État a été accueilli avec réticence par le participant qui l'a joué, ce qui suggère soit une méfiance à l'égard de l'efficacité de l'intervention gouvernementale, soit un manque d'aisance dans ce rôle, ce qui peut indiquer un domaine à améliorer dans la sélection ou la formation des participants.

4. Idées novatrices et solutions proposées :

Des solutions créatives : Les discussions sur le développement des incubateurs d'étudiants mettent en évidence la pensée innovante et la vision prospective nécessaires pour transformer l'environnement universitaire et entrepreneurial.

Des propositions concrètes : L'accent mis sur le rôle de l'État dans le soutien à l'innovation et à l'esprit d'entreprise donne une orientation claire à l'action future qui peut être appliquée à la politique publique.

5. Défis et obstacles :

Des défis communs : Le financement inadéquat et l'éducation limitée sont des défis récurrents dans les pays en développement, et leur identification dans les discussions confirme la pertinence et l'applicabilité des questions soulevées aux réalités locales...

6. Recommandations d'amélioration :

Améliorer les sessions : Les commentaires positifs sur la structure du groupe et la méthodologie suggèrent que le format du jeu de rôle est efficace, mais la clarté des rôles et des objectifs pourrait être améliorée pour maximiser les avantages de ce format.

7. Commentaires divers et non structurés :

Impact du format : l'approche par étude de cas a généré des informations sur des actions et des processus concrets, évitant le piège des déclarations génériques, ce qui est essentiel pour obtenir des résultats orientés vers l'action et applicables dans les projets de développement.

Les réponses des sujets ont été analysées en fonction de chacun des objectifs de l'étude de cas

Stimuler l'esprit d'entreprise

Le manque de compétences entrepreneuriales des agriculteurs d'un village pratiquant l'agriculture holistique a constitué une préoccupation majeure lors des discussions. Les participants ont reconnu que l'accès limité aux marchés est un obstacle important à l'adoption de telles pratiques.

L'importance des partenariats entre les établissements d'enseignement et les communautés locales pour fournir une formation pertinente a été soulignée. Parmi les solutions proposées figurent le développement de canaux de vente directe et l'utilisation de la technologie pour améliorer l'accès au marché.

Certains participants ont suggéré d'organiser des ateliers pour former les agriculteurs aux techniques de marketing numérique et à la gestion des entreprises agricoles. La nécessité de programmes gouvernementaux pour subventionner les initiatives entrepreneuriales dans le secteur agricole a été mentionnée. La création d'un réseau de soutien entre agriculteurs pour encourager l'échange d'idées et de stratégies a également été discutée.



La question des impôts et taxes pesant sur les petites entreprises a été soulevée, et il a été recommandé de les adapter pour encourager l'esprit d'entreprise. Un système de tutorat entre les agriculteurs expérimentés et les nouveaux venus a également été suggéré.

Les discussions ont révélé un consensus général sur la nécessité d'intégrer l'éducation à l'esprit d'entreprise dans les programmes des écoles d'agriculture.

Renforcer le potentiel d'innovation

Le groupe d'étudiants qui a développé un nouveau type d'engrais biologique s'est heurté au scepticisme local et au manque de ressources financières pour tester et promouvoir le produit. L'importance du soutien institutionnel pour tester et certifier les nouveaux produits a été reconnue. Les participants ont suggéré des partenariats entre les universités et les jeunes entreprises pour faciliter l'accès aux laboratoires et aux essais sur le terrain.

Une discussion animée a eu lieu sur la manière de stimuler l'innovation par des subventions et un financement ciblé de la recherche. Il a été suggéré d'utiliser les réseaux sociaux et les plateformes en ligne pour accroître la sensibilisation et l'acceptation des engrais organiques. L'importance des démonstrations pratiques et des exemples de réussite a été discutée, compte tenu des difficultés d'adoption des innovations dans les communautés rurales.

Un participant a mentionné la nécessité d'un cadre réglementaire plus souple pour permettre de tester rapidement les innovations agricoles. La nécessité d'éduquer les agriculteurs sur les avantages à long terme de l'utilisation d'engrais organiques a été soulignée.

L'idée de créer des incubateurs dans les universités pour soutenir la commercialisation des innovations a été discutée. Il a été question de créer un fonds spécial pour soutenir les start-ups agricoles, géré par une collaboration entre l'État et le secteur privé. Le rôle des médias dans la promotion des réussites en matière d'innovation agricole pour inspirer et motiver l'ensemble de la communauté a été souligné.

Créer des innovations dans le domaine de l'agriculture holistique

La découverte d'une nouvelle méthode de lutte contre les parasites par les chercheurs a été accueillie avec enthousiasme, mais le manque de collaboration entre les universités, les entrepreneurs et les étudiants a entravé son adoption à grande échelle. L'importance d'établir des plateformes communes de communication et de coopération entre ces entités a été discutée.

Les participants ont suggéré la création de programmes d'échange d'expériences et de connaissances entre le monde universitaire et l'industrie. Ils se sont accordés sur la nécessité d'intégrer des cours sur l'esprit d'entreprise et l'innovation dans les programmes d'études universitaires.

Il a été suggéré d'utiliser les technologies numériques pour faciliter la collaboration et accélérer les processus d'innovation. Un participant a suggéré d'organiser des hackathons et des concours d'idées réunissant des étudiants, des chercheurs et des entrepreneurs.

La nécessité de politiques gouvernementales pour stimuler l'innovation et la collaboration interdisciplinaire a été reconnue.

Les discussions ont mis en évidence l'importance d'un financement continu et de ressources adéquates pour la recherche appliquée. La difficulté de convaincre les agriculteurs d'adopter de nouvelles méthodes sans preuve concrète de leur efficacité a été mentionnée. La création de centres d'excellence pour l'innovation agricole, qui serviraient de plaques tournantes pour la diffusion des nouvelles technologies et pratiques, a été discutée. La nécessité d'un mentorat et d'une orientation continue pour les jeunes chercheurs et entrepreneurs dans ce domaine a été soulignée.

Ces informations mettent en évidence les défis et les solutions proposés par les participants aux groupes de discussion, fournissant ainsi une base solide pour les initiatives futures et l'amélioration des pratiques actuelles dans le secteur agricole.

4. LES CONCLUSIONS

L'analyse des attitudes des enseignants à l'égard de l'apprentissage de l'entrepreneuriat a mis en évidence la nécessité d'innover dans l'enseignement, l'utilisation de différentes méthodologies, la disponibilité d'opportunités de formation pour les enseignants, et les observations des enseignants, des étudiants et de la communauté des affaires sur l'apprentissage de l'entrepreneuriat dans les universités partenaires ciblées.

Les enseignants de l'enseignement supérieur au Kenya, au Nigeria et au Togo sont conscients de la nécessité d'adapter les programmes d'études à l'évolution rapide de l'économie et de la technologie. Cette adaptation permet non seulement de maintenir la pertinence de l'enseignement, mais aussi de s'assurer que les étudiants sont bien préparés à entrer sur un marché du travail en constante évolution, améliorant ainsi leurs perspectives de carrière dans un paysage mondial compétitif.

Les éducateurs reconnaissent de plus en plus l'impact du changement climatique sur l'agriculture, ce qui a conduit à l'intégration de pratiques durables et de nouvelles technologies dans les programmes d'études. Cela reflète la responsabilité de former une nouvelle génération de professionnels capables de mettre en œuvre et de promouvoir des pratiques agricoles efficaces et respectueuses de l'environnement...

L'évolution démographique, caractérisée par l'accélération de l'urbanisation et la baisse des taux de natalité, pose un défi de taille aux éducateurs, qui doivent trouver des moyens efficaces d'attirer et de retenir les jeunes dans les zones rurales. L'enseignement de l'entrepreneuriat axé sur l'innovation technologique s'avère être une stratégie prometteuse à cet égard.

L'expérience internationale est extrêmement précieuse pour les étudiants et les enseignants soutiennent activement la participation à des programmes d'échange qui exposent les étudiants à de nouvelles technologies et pratiques agricoles. Ces expériences enrichissent l'apprentissage et ouvrent les yeux des étudiants sur des méthodes durables qui peuvent être appliquées efficacement chez eux.

Au Nigeria, l'intégration de la technologie dans l'éducation est évidente, avec des étudiants impliqués dans des projets utilisant l'intelligence artificielle pour optimiser la production agricole. Cela permet non seulement d'améliorer les résultats de l'apprentissage, mais aussi de préparer les étudiants à des carrières dans des secteurs technologiques avancés.

Les stages au Togo constituent une passerelle précieuse entre la théorie académique et la pratique agricole, aidant les étudiants à acquérir une compréhension approfondie des défis du monde réel et à développer des solutions applicables. Il s'agit d'une composante essentielle de l'éducation, car elle permet de faire le lien entre les connaissances théoriques et la réalité pratique du travail sur le terrain.

Les différences régionales dans les méthodes d'enseignement soulignent la diversité des approches éducatives dans les différents pays. Par exemple, l'utilisation de simulations et de jeux de rôle est courante au Kenya, alors que les méthodes traditionnelles sont privilégiées au Togo. Cette diversité souligne la nécessité de ressources supplémentaires pour soutenir la transition vers des méthodes plus interactives et centrées sur l'apprenant.

L'accès aux ressources telles que les programmes de mentorat et les pépinières d'entreprises varie considérablement d'une région à l'autre. Au Nigeria, les étudiants bénéficient d'un large éventail d'opportunités, alors qu'au Togo, les contraintes financières et technologiques constituent des obstacles majeurs au développement de l'enseignement de l'entrepreneuriat.



Les partenariats avec l'industrie sont essentiels pour relier la théorie à la pratique, en offrant aux étudiants des possibilités d'apprentissage par le biais de stages et de projets de recherche appliquée. Ces collaborations enrichissent non seulement l'expérience éducative, mais améliorent également l'employabilité des diplômés.

Les enseignants soulignent l'importance du développement continu des compétences, tant techniques que non techniques, et reconnaissent que l'évolution du marché du travail exige une adaptation constante. Les programmes de formation continue sont donc essentiels pour maintenir la pertinence professionnelle des diplômés.

Les enseignants insistent particulièrement sur l'amélioration des infrastructures éducatives pour soutenir la technologie et les méthodes d'enseignement fondées sur la recherche, soulignant la nécessité de moderniser les installations pour suivre le rythme des innovations dans le secteur de l'éducation.

La nécessité pour l'enseignement de l'entrepreneuriat de relever les défis mondiaux tels que le changement climatique et la sécurité alimentaire est fréquemment mentionnée. Cela souligne l'importance d'un engagement en faveur de pratiques durables et éthiques dans la formation des futurs chefs d'entreprise et innovateurs.

La résilience et l'optimisme dont font preuve les enseignants face aux défis reflètent un fort désir de surmonter les obstacles et de contribuer à la construction d'un avenir meilleur. Cette attitude positive est essentielle pour inspirer et motiver les élèves à poursuivre des carrières entrepreneuriales et innovantes.

Le consensus parmi les éducateurs sur le fait que la formation à l'entrepreneuriat peut agir comme un catalyseur pour le développement économique et personnel démontre une reconnaissance de la valeur de ce type de formation pour stimuler la croissance économique et améliorer la vie des individus.

Les défis identifiés lors des sessions des groupes de discussion, tels que le financement inadéquat et l'accès limité aux ressources éducatives, soulignent la nécessité d'améliorer les stratégies pour maximiser l'impact de la formation à l'entrepreneuriat.

Les discussions sur le rôle du gouvernement dans la stimulation de l'innovation et de l'esprit d'entreprise mettent en évidence la nécessité de politiques de soutien qui facilitent les initiatives innovantes et promeuvent une culture entrepreneuriale forte.

L'impact du format de l'étude de cas sur la génération de solutions concrètes et orientées vers l'action illustre l'efficacité de cette méthode dans l'enseignement de l'entrepreneuriat, permettant aux étudiants d'explorer des scénarios de la vie réelle et de développer des compétences applicables dans l'environnement des affaires.

La nécessité d'améliorer la clarté des rôles et des objectifs dans les sessions de groupes de discussion est reconnue comme cruciale pour maximiser les avantages de cette méthode d'apprentissage par l'expérience, ce qui suggère que des ajustements dans la conception pédagogique peuvent conduire à de meilleurs résultats éducatifs.

Les solutions innovantes et créatives proposées dans les groupes de discussion, telles que le développement de pépinières d'entreprises et de programmes de tutorat, reflètent la réflexion prospective et anticipative qui est essentielle pour s'adapter à une économie mondiale en mutation.



Enfin, la collaboration entre le monde universitaire, l'industrie et les pouvoirs publics est considérée comme essentielle pour soutenir l'innovation et l'esprit d'entreprise, ce qui souligne la nécessité de redoubler d'efforts pour surmonter les obstacles systémiques.

La nécessité d'innover dans l'enseignement

L'innovation dans l'enseignement est essentielle pour maintenir la pertinence académique face aux changements technologiques et économiques rapides. En utilisant des méthodes innovantes telles que la réalité augmentée ou l'apprentissage par projet, les éducateurs peuvent améliorer l'engagement et la rétention des étudiants, et mieux les préparer aux défis du marché du travail mondial.

Utiliser diverses méthodologies

La diversification des méthodes d'enseignement, qu'elles soient traditionnelles, centrées sur l'étudiant ou interdisciplinaires, enrichit l'expérience éducative et stimule la pensée critique et créative. L'utilisation d'un mélange de simulations, d'études de cas et de travail en équipe interdisciplinaire facilite un apprentissage approfondi et applicable, ce qui est essentiel pour le développement des compétences entrepreneuriales.

Disponibilité des possibilités de formation pour les enseignants

Les possibilités de formation des enseignants sont essentielles pour mettre à jour et améliorer les compétences en matière d'enseignement et de recherche. Les programmes de développement professionnel, les ateliers et les conférences contribuent à maintenir un niveau élevé d'enseignement et permettent aux enseignants de se tenir au courant des dernières tendances et technologies en matière d'éducation.

Rétroaction des enseignants, des étudiants et des entreprises sur l'apprentissage de l'entrepreneuriat

Les réactions des enseignants, des étudiants et de la communauté des affaires soulignent l'importance de l'apprentissage entrepreneurial comme moyen de développer les compétences nécessaires à l'innovation et à l'esprit d'entreprise. Les observations communes indiquent une demande accrue de programmes d'études qui intègrent des pratiques entrepreneuriales réelles, un mentorat par des chefs d'entreprise et une collaboration étroite avec l'industrie, autant d'éléments essentiels pour doter les étudiants de compétences utiles dans l'économie d'aujourd'hui.

Les compétences de base identifiées dans la recherche comprennent l'adaptabilité aux changements technologiques et de marché, l'expertise dans les technologies modernes, la mise en œuvre de pratiques durables, des compétences avancées en matière de communication et de collaboration, l'esprit d'entreprise et d'innovation, la pensée critique, le leadership, les compétences en matière de recherche et d'analyse, la planification stratégique et un engagement profond en faveur de l'éthique et de la responsabilité sociale.

Adaptabilité et flexibilité

Les entrepreneurs et les éducateurs doivent développer une capacité d'adaptation exceptionnelle pour répondre de manière dynamique aux changements rapides de l'économie mondiale. Cela comprend l'adaptation rapide aux nouvelles technologies et aux demandes du marché, ainsi que la capacité d'innover dans les méthodes d'enseignement pour améliorer l'efficacité et la pertinence de l'éducation.

Utilisation de technologies avancées

La compétence dans l'utilisation des technologies avancées, telles que les systèmes d'irrigation automatisés et l'intelligence artificielle, est essentielle pour optimiser la production et gérer des entreprises durables. Cela nécessite une compréhension approfondie des applications technologiques et la capacité de les intégrer dans les processus existants.

Durabilité et gestion des ressources





La capacité à mettre en œuvre des pratiques durables et à gérer efficacement les ressources est essentielle face au changement climatique. Il s'agit notamment de mettre au point des cultures résistantes et d'utiliser de manière innovante des ressources rares telles que l'eau, afin d'assurer la durabilité à long terme.

Compétences sociales et de communication

Les compétences en matière de communication et d'interaction sociale sont essentielles pour gérer la complexité des relations au sein des entreprises et des universités. Ces compétences permettent d'établir des partenariats efficaces, de mener des discussions productives et de créer des réseaux de soutien.

Compétences en matière d'entrepreneuriat et d'innovation

La capacité à identifier les opportunités du marché et à développer des solutions innovantes est cruciale pour les entrepreneurs et les étudiants. Cela implique une pensée créative, une évaluation des risques et la capacité de transformer des idées en produits ou services compétitifs.

Pensée critique et résolution de problèmes

L'esprit critique et les compétences en matière de résolution de problèmes sont essentiels pour évaluer les différentes situations professionnelles et universitaires, relever les défis et élaborer des stratégies efficaces. Ces compétences sont nécessaires pour naviguer dans des scénarios complexes et optimiser les décisions.

Leadership et gestion d'équipe

La capacité à diriger et à gérer des équipes est fondamentale pour le développement de projets entrepreneuriaux et éducatifs. Cela nécessite non seulement des compétences en gestion, mais aussi la capacité d'inspirer et de motiver les équipes pour qu'elles travaillent à la réalisation d'objectifs communs.

Compétences en matière de recherche et d'analyse

La capacité à mener des recherches rigoureuses et à analyser des données est essentielle dans les domaines de la science et de l'entrepreneuriat. Ces compétences permettent de fonder les décisions sur des données probantes et de promouvoir les pratiques fondées sur la connaissance et l'innovation.

Compétences en matière de planification stratégique

La planification stratégique est nécessaire à la réussite à long terme, car elle permet aux entrepreneurs et aux éducateurs d'anticiper les changements du marché et d'élaborer des plans efficaces qui répondent à la fois aux besoins immédiats et aux objectifs à long terme.

Éthique et responsabilité sociale

Dans un monde de plus en plus axé sur l'impact social et environnemental, la capacité à opérer de manière éthique et responsable est de plus en plus appréciée. Cela implique un engagement en faveur de pratiques durables, de la transparence et de l'équité dans toutes les actions entreprises.



Annexe

Annexe 1 Modèle de formulaire d'entretien pour les entrepreneurs

GUIDE D'ENTRETIEN* pour les entrepreneurs

Nom de l'enquêteur

Date

Merci d'avoir pris le temps de nous parler aujourd'hui.

Nous nous appelons et nous venons de (Université de).

Nous sommes une équipe qui participe à la recherche sur la "Coopération pour les nids d'innovation de l'agriculture holistique en Afrique subsaharienne", nécessaire pour que notre université connaisse les problèmes du secteur agroalimentaire.

Nous vous assurons qu'il ne s'agit pas d'un contrôle. Nous prendrons des notes afin de ne rien oublier d'important de la discussion. Ces notes et la discussion que nous aurons sont confidentielles (elles ne sont destinées qu'à nous et ne seront accessibles à aucune institution administrative).

Nous parlerons des aspects de votre entreprise et de la région dans laquelle vous opérez.

N'hésitez pas à exprimer vos opinions. Nous sommes à votre écoute.

Question 1 Introduction (5 minutes de discussion pour détendre l'atmosphère)

Comment s'est déroulée l'année 2023 ? Quelle est la meilleure chose qui se soit produite récemment dans votre entreprise ?

Notes synthétiques

Question 2 Environnement et changement climatique (les discussions seront orientées vers la description de certaines situations et actions entreprises)

Quels ont été les principaux défis environnementaux ? Avez-vous remarqué des changements environnementaux et que deviez-vous faire ? Qu'est-ce qui pourrait vous aider à cet égard ?

Notes synthétiques

Question 3 Situation démographique (les discussions seront orientées vers les opinions et les actions)

Votre entreprise est-elle touchée par la baisse de la natalité ? L'évolution de la conception de la famille a-t-elle une incidence sur votre entreprise ?

Peuvent être abordés : la migration, la naissance, le mariage, etc.



Notes synthétiques

Question 4 Climat économique (les discussions seront orientées vers l'action)

Quelles ont été les difficultés rencontrées sur le plan économique ?

Peuvent être abordés : l'évolution des prix, les dysfonctionnements de l'offre, l'évolution de la consommation, etc.

Notes synthétiques

Question 5 Climat social (les discussions seront orientées vers l'action)

Quelles ont été les difficultés rencontrées sur le plan social ?

Les thèmes suivants peuvent être abordés : la migration de la main-d'œuvre, le chômage en général et celui des jeunes en particulier, la réduction/l'amélioration de l'accès à l'éducation, etc.

Notes synthétiques

Question 6 Traditions et coutumes (les discussions seront orientées vers l'action)

Votre activité repose-t-elle sur certaines traditions ou habitudes de consommation ? Avez-vous dû prendre certaines mesures pour modifier votre mode de consommation ?

Peuvent être abordés : les modes de consommation actuels en corrélation avec les modes de consommation traditionnels, les difficultés d'adaptation de la production à l'évolution de la demande, la concurrence des produits traditionnels par rapport aux produits importés, etc.



Notes synthétiques

Question 7 Environnement psychosocial (les discussions seront axées sur les opinions)

Avez-vous remarqué des changements dans la perception du bien-être des employés et des clients ? Certaines situations ont-elles attiré votre attention ? Quelles sont les principales différences générationnelles en matière de bien-être ?

Les éléments suivants peuvent être examinés : l'attitude des clients, les opinions concernant les compétences des jeunes au moment de l'embauche, les opinions concernant les attentes des jeunes au moment de l'embauche, l'atmosphère générale des employés dans l'entreprise, etc.

Notes synthétiques

Question 8 Impact culturel (les discussions porteront sur les opinions et les actions entreprises)

Pensez-vous qu'il y a eu des changements importants dans la culture locale, régionale ou nationale ? Avez-vous pris des mesures pour tirer parti de ces changements ou les atténuer ?

Les thèmes suivants peuvent être abordés : l'impact de l'éducation sur le niveau de vie, la pertinence des événements culturels pour l'activité des sujets, etc.

Notes synthétiques

Question 9 Contexte législatif (les discussions seront orientées vers l'action)

Avez-vous rencontré de grandes difficultés pour modifier certaines lois ? Quel a été l'impact des changements législatifs sur l'entreprise ? L'entreprise, ses propres employés, ses partenaires vous aident-ils à adapter votre activité aux exigences législatives ?

Peuvent être discutés : la perception générale de la législation, les actions déterminées par les changements législatifs, etc.

Les sujets seront assurés que vous ne cherchez pas à obtenir des informations sur des violations de la loi et que leurs réponses ne les affecteront en aucune façon.





Notes synthétiques

Question 10 Climat politique (les discussions seront orientées vers les opinions)

Comment décririez-vous le climat politique en quelques mots ? Est-ce suffisamment prévisible ? Y a-t-il des changements d'impact significatifs ?

Les points suivants peuvent être abordés : soutien politique aux entrepreneurs, représentation des producteurs par le biais d'associations professionnelles ou d'associations de produits, communication avec le ministère représentant la branche, etc.

Les sujets seront assurés que les discussions ne portent pas sur leurs choix politiques.

Notes synthétiques

Question 11 Climat institutionnel (les discussions seront orientées vers l'action)

Comment décririez-vous en quelques mots les relations de votre entreprise avec les institutions publiques ? Y a-t-il des institutions non gouvernementales avec lesquelles vous collaborez ?

Peuvent être discutés : l'efficacité des institutions administratives, les situations créées par certaines pratiques des institutions publiques, les actions entreprises pour compenser ou réduire l'effet de certains services publics, etc.

Notes synthétiques

Question 12 Compétences pour l'emploi dans l'agro-industrie (discussions d'opinion)

Selon vous, quelles sont les trois principales compétences requises pour les diplômés de l'enseignement supérieur qui souhaitent travailler dans une entreprise comme la vôtre ?

(Les arguments en faveur de ces mesures sont attendus)



Notes synthétiques

Question 13 Compétences pour l'entrepreneuriat agroalimentaire (discussions sur l'opinion des sujets sur ce qu'un entrepreneur dans ce domaine doit savoir et être capable de faire)

Quelles sont, selon vous, les trois compétences qui vous ont le plus aidé dans votre entreprise ?

(Des arguments ou des exemples sont demandés pour ces questions)

Notes synthétiques

Nous vous remercions de nous avoir aidés à comprendre certains aspects de votre entreprise. Ces informations sont précieuses et seront utiles au développement de ce domaine d'activité.

Débriefing de l'équipe après l'entretien

- a. Évaluation de la volonté des sujets de participer aux discussions
- b. Évaluations concernant l'ambiance générale de l'entretien
- c. Évaluations de l'humeur (optimiste, pessimiste, équilibrée)
- d. Évaluations de la confiance des sujets dans l'éducation et la recherche
- e. Autres appréciations en fonction de l'impression générale





Annexe 2 Modèle de formulaire d'entretien avec un étudiant

GUIDE D'ENTRETIEN* pour les étudiants

Nom de
l'enquêteur

Données

Merci d'avoir pris le temps de nous parler aujourd'hui.

Nous nous appelons

Nous sommes une équipe qui participe à la réalisation de la recherche sur la « Coopération pour les nids d'innovation de l'agriculture holistique en Afrique subsaharienne », nécessaire pour que notre université connaisse les enjeux de l'agroalimentaire et les compétences nécessaires aux spécialistes du domaine pour développer l'agriculture holistique. Soyez assurés que nous ne partagerons vos réponses que sous une forme centralisée, sans possibilité d'association avec votre nom. Nous ne prendrons que des notes afin de ne rien oublier d'important dans la discussion. Ces notes et la discussion que nous aurons sont confidentielles (elles ne sont destinées qu'à nous-mêmes et ne seront accessibles à aucune institution administrative).

Nous parlerons des opportunités d'emploi ou d'affaires dans le secteur agroalimentaire.

N'hésitez pas à exprimer votre point de vue. Nous sommes là pour vous écouter.

Question 1 Introduction (5 minutes de discussion pour détendre l'atmosphère)

Quelle est l'échéance de 2023 ? Quel est le montant le plus élevé de l'aide financière que vous pouvez obtenir dans le cadre de votre activité professionnelle ?

Note synthétique

Question 2 Points forts en matière d'emploi (la discussion** sera orientée vers l'opinion)

Quels sont, selon vous, vos atouts pour travailler dans le secteur agroalimentaire ?

Notes synthétiques





Question 3 Points faibles pour l'emploi (la discussion sera orientée sur les opinions)

Quels sont, selon vous, vos points faibles en matière d'emploi dans le secteur agroalimentaire ? Qui ou quoi peut vous aider dans ce domaine ?

Notes synthétiques

Question 4 Possibilités d'emploi (la discussion sera orientée sur les opinions)

Quelles sont, selon vous, les opportunités qui peuvent faciliter votre emploi dans le secteur agroalimentaire ?

Notes synthétiques

Question 5 Menaces pour l'emploi (la discussion sera orientée sur les opinions)

Quelles sont, selon vous, les difficultés actuelles qui pourraient limiter votre emploi dans le secteur agroalimentaire ?

Notes synthétiques

Question 6 Points forts pour l'entrepreneuriat (la discussion sera orientée sur les opinions)

Quels sont les points forts que vous pensez posséder et qui sont utiles pour créer une entreprise dans le secteur agroalimentaire ?

Notes synthétiques



Question 7 Points faibles de l'esprit d'entreprise (la discussion sera orientée sur les opinions)

Quels sont, selon vous, les points faibles qui vous empêcheront de créer une entreprise dans le secteur agroalimentaire ? Qui ou quoi peut vous aider à cet égard ?

Notes synthétiques

Question 8 Opportunités pour l'entrepreneuriat (la discussion sera orientée sur les opinions)

Quelles sont, selon vous, les opportunités de création d'entreprise dans le secteur agroalimentaire ?

Notes synthétiques

Question 9 Menaces pour l'esprit d'entreprise (la discussion sera orientée sur les opinions)

Quelles sont, selon vous, les difficultés économiques qui pourraient vous empêcher de créer une entreprise dans le secteur agroalimentaire ?

Notes synthétiques

Question 10 Compétences pour l'emploi dans une entreprise agroalimentaire (discussion des opinions)

Quelles sont, selon vous, les 3 principales compétences dont vous avez besoin pour travailler dans une entreprise mettant en œuvre une agriculture holistique ?

(Des arguments et des exemples sont attendus)



Notes synthétiques

Question 11 Compétences pour l'entrepreneuriat dans les entreprises agroalimentaires (discussion des points de vue des répondants sur ce qu'un entrepreneur dans ce domaine doit savoir, être capable de faire)

Les trois principales aptitudes que les agriculteurs doivent avoir pour mettre en œuvre l'agriculture holistique dans leur propre pays sont les suivantes : les compétences, l'expérience et les connaissances.

(Des arguments ou des exemples pour ces éléments sont demandés)

Notes synthétiques

Nous vous remercions de nous avoir aidés à comprendre certains aspects de votre travail. Ces informations sont précieuses et seront utiles pour développer ce domaine de travail.

Débriefing de l'équipe d'entretien après l'entretien

- Nous vous remercions de bien vouloir respecter la disponibilité des personnes autorisées à participer à la discussion.
- Nous vous remercions de bien vouloir prendre en compte l'avis général de l'Assemblée générale des Nations unies.
- Évaluez votre humeur (optimiste, pessimiste, équilibrée).
- Nous vous remercions de bien vouloir prendre connaissance de la liste des thèmes abordés dans le cadre de ce projet.
- Autres jugements sur l'impression générale





Annexe 3 Modèle de formulaire d'entretien avec un enseignant

GUIDE D'ENTRETIEN* pour les enseignants

Nom de
l'enquêteur.....

Données

Merci d'avoir pris le temps de nous parler aujourd'hui.

Nous nous appelons et nous venons de (Université).

Nous sommes une équipe impliquée dans la conduite d'une recherche sur la « Coopération pour des nids d'innovation en agriculture holistique en Afrique subsaharienne », nécessaire à notre université pour connaître les enjeux dans le domaine agroalimentaire et les compétences nécessaires aux spécialistes du domaine pour développer l'agriculture holistique. Nous nous intéressons à l'interdépendance de l'agriculture avec les cadres naturel, démographique, psychosocial, historique, économique, culturel, juridique, politique et institutionnel.

Nous vous assurons qu'il ne s'agit pas d'un contrôle. Nous prendrons seulement des notes afin de ne rien oublier d'important dans la discussion. Ces notes et la discussion que nous aurons sont confidentielles (elles ne sont destinées qu'à nous-mêmes et ne seront accessibles à aucune institution administrative).

Nous parlerons de questions dans votre domaine de spécialisation en relation avec le secteur agroalimentaire.

N'hésitez pas à exprimer votre point de vue. Nous sommes là pour vous écouter.

Question 1 Introduction (5 minutes de discussion pour détendre l'atmosphère)

Qu'en est-il en 2023 ? Quelle est la principale raison pour laquelle le secteur agroalimentaire s'est développé dans la perspective d'une spécialisation dans le domaine de l'agriculture ?

Notes synthétiques

Question 2 Points forts en faveur de la mise en œuvre de l'agriculture holistique (la discussion sera orientée vers l'opinion)**

Selon vous, quels sont les points forts du secteur agroalimentaire national qui favorisent la mise en œuvre de l'agriculture holistique ?



Notes synthétiques

Question 3 Faiblesses pour la mise en œuvre de l'agriculture holistique (discussion sur les opinions des sujets)

Quelles sont, selon vous, les faiblesses du secteur agroalimentaire national qui pourraient entraver la mise en œuvre de l'agriculture holistique ?

Notes synthétiques

Question 4 Possibilités de mise en œuvre d'une agriculture holistique (la discussion sera axée sur les opinions)

Quelles sont, selon vous, les menaces qui pèsent sur le secteur agroalimentaire national ? Quel est l'impact de la mise en œuvre d'une politique agricole holistique ?

Notes synthétiques

Question 5 Menaces pour la mise en œuvre de l'agriculture holistique (la discussion sera orientée sur les opinions)
 Quelles sont, selon vous, les opportunités pour le secteur agroalimentaire national ? Quel est l'impact de ces opportunités sur la mise en œuvre de l'agriculture holistique ?

Notes synthétiques

Question 6 Compétences pour l'emploi dans les entreprises agroalimentaires (discussion des opinions)
Les trois principales compétences requises pour être titulaire d'un diplôme en agriculture holistique sont les suivantes : les entreprises qui mettent en œuvre l'agriculture holistique, les entreprises qui ne sont pas titulaires d'un diplôme en agriculture holistique et les entreprises qui ne sont pas titulaires d'un diplôme en agriculture holistique.
(Se așteaptă argumente și exenple pentru acestea)



Notes synthétiques

Question 7 Compétences pour l'entrepreneuriat dans l'agroalimentaire (discussion sur les opinions des sujets sur ce qu'un entrepreneur doit savoir, pour être capable de faire dans ce domaine)

Les 3 principales aptitudes que les agriculteurs doivent posséder pour pouvoir mettre en œuvre l'agriculture holistique sont les suivantes ?

(Des arguments ou des exemples sont nécessaires)

Notes synthétiques

Merci de nous avoir aidés à comprendre certains aspects de votre travail. Ces informations sont précieuses et seront utiles pour développer ce domaine de travail.



Debriefing-ul echipei de interviatori după interviu

- a. Nous vous remercions de bien vouloir respecter la disponibilité des personnes autorisées à participer à la discussion.
- b. Nous vous remercions de bien vouloir prendre en compte l'avis général de l'Assemblée générale des Nations unies.
- c. Évaluez votre humeur (optimiste, pessimiste, équilibrée).
- d. Nous vous remercions de bien vouloir prendre connaissance de la liste des thèmes abordés dans le cadre de ce projet.
- e. Autres jugements sur l'impression générale



Anexa 4 Études de cas utilisées dans le cadre de la recherche FOCUS GRUP

1. Stimuler la pensée entrepreneuriale

Étude de cas : Dans un village, une initiative d'agriculture holistique échoue en raison d'un manque de connaissances entrepreneuriales et d'un accès limité au marché. Les agriculteurs sont découragés et envisagent d'abandonner les pratiques holistiques.

2. Stimuler le potentiel d'innovation

Étude de cas : Un groupe d'étudiants développe un nouveau type d'engrais organique mais rencontre des difficultés pour le tester et le promouvoir en raison de ressources financières limitées et du scepticisme de la population locale.

3. Créer des innovations dans le domaine de l'agriculture holistique

Étude de cas : Des chercheurs découvrent une méthode révolutionnaire de lutte contre les parasites, mais la collaboration entre les universités, les entrepreneurs et les étudiants est faible, ce qui empêche une adoption généralisée.

4. Transformer les étudiants et les entrepreneurs en innovateurs

Étude de cas : Un entrepreneur a une idée novatrice pour recycler les déchets organiques en énergie, mais il ne dispose pas d'un système de mentorat pour le guider dans le développement de son idée.

5. Transformer les entreprises en agriculture holistique

Étude de cas : Une coopérative tente d'adopter des pratiques holistiques mais se heurte à la résistance des membres qui craignent le changement et les investissements initiaux.

6. Transformer les innovations en entreprises en pleine croissance

Étude de cas : Au Togo, une startup lance une application mobile pour connecter les agriculteurs aux marchés locaux, mais elle est confrontée à des problèmes techniques et à un manque de confiance de la part des agriculteurs.



Anexa 5

Formulaire de consentement éclairé pour la participation à un groupe de discussion

Titre du projet : Coopération pour des nids d'innovation en agriculture holistique en Afrique subsaharienne

Organisateurs :

Date :

Lieu :

Objectif du groupe de discussion : Explorer et développer des stratégies pour stimuler la pensée entrepreneuriale et l'innovation dans l'agriculture holistique.

Description du projet :

Ce groupe de discussion fait partie d'une étude plus large visant à identifier et à analyser les opportunités et les défis de l'agriculture holistique en Afrique subsaharienne. L'objectif de la session est de recueillir des données et des opinions des participants sur divers sujets spécifiques, qui seront utilisées pour formuler des recommandations et des stratégies dans le contexte du projet mentionné.

Procédure : Au cours du groupe de discussion, il vous sera demandé de participer à des discussions de groupe dirigées par un modérateur. Les discussions seront enregistrées en audio et/ou vidéo afin de garantir l'exactitude des informations collectées. La session devrait durer environ [nombre] heures.

Confidentialité : Toutes les informations personnelles recueillies au cours de ce groupe de discussion resteront confidentielles. Votre identité ne sera pas divulguée dans tout rapport ou publication résultant de ce projet, et les données collectées ne seront présentées que sous forme agrégée ou anonyme.

Droits des participants : Votre participation est volontaire et vous avez le droit de vous retirer de l'étude à tout moment sans que cela n'affecte votre relation avec les organisateurs ou l'institution hôte.

Consentement :

En signant ce formulaire, vous confirmez que vous avez compris les informations présentées et que vous acceptez de participer à ce groupe de discussion. Vous acceptez également l'enregistrement audio/vidéo des discussions auxquelles vous participerez.

Contact : Pour toute question relative à l'étude ou à vos droits en tant que participant, vous pouvez contacter [Nom et coordonnées du délégué à la protection des données ou du chercheur de l'institution hôte].

Signature du participant :

Date :

Chercheur/gestionnaire de projet Signature :

Date :

Weihenstephan - Triesdorf University of Applied Sciences

Department of Agriculture, Food, and Nutrition

Masters of Science in International Farm Management

Master's thesis

**Development of a Sustainable Agri-Food System Through Education and
Innovation Among Small and Medium-Scale Entrepreneurs in Kenya for Holistic
Agriculture**

Submitted by:

BRENDA AJIAMBO OUMA

Supervisor:

DR. BERND MUELLER

Issuing professor:

PROF. DR. RALF SCHLAUDERER

Date of submission:

3rd November 2024

Table of Content

1.0. INTRODUCTION	1
1.1. Problem statement	1
1.2. Study Objectives	2
1.3. Limiting Conditions for the Study	2
Categorization of entrepreneurs	2
Unwillingness of some of the entrepreneurs to indulge information	3
High Expectations from Entrepreneurs	3
Limited Time for planning and scheduling	3
Conflicting points among the Focus Group participants	3
2. 0. LITERATURE REVIEW	4
3. 0. MATERIAL AND METHODS	10
3.1. Study Area	10
Institutes;	11
Centers	11
South Eastern University.....	12
3.2. Research Design	14
Participants	14
3.3. Data Collection Methods	16
Interviews.....	16
Objectives of the interview:.....	16
Format of Conducting the Interview.....	18
Questionnaires.....	19
Questionnaire objectives	19
Sample Structure	19
South Eastern Kenya University – SEKU.....	21
Jaramogi Oginga Odinga University of Science and Technology – JOOUST.....	22
Focus Group	23
Focus Group discussion Objectives.....	23
Conducting the Focus Group Session	26
Thematic Discussions	26
Interactive Workshops.....	27
Group 1: Innovation and Policy:	27

Group 2: Implementation and Market Impact:	27
Group 3: Community and Culture:.....	27
SWOT Matrix Development	27
Observation.....	28
Education and knowledge sharing	28
Innovation technologies adoption	29
Holistic agriculture practices.....	29
Economic and Social Dimensions:.....	29
4. 0. RESULTS AND DISCUSSION.....	30
4.1. The role of Education in promoting Sustainability	31
Entrepreneurial skills and training	31
Innovative Agricultural Education.....	32
Entrepreneurial Thinking Stimulation among SMEs Entrepreneurs.....	33
Constraints hindering Entrepreneurial Thinking Stimulation among SMEs Entrepreneurs in Kenya	36
4.2. Innovation as a catalyst for sustainable practices	38
Technological advancements.....	38
Value Addition.....	39
Barriers to Innovation	40
4.3. Economic feasibility of sustainable practices	42
Financial Management and Market understanding	42
Opportunities for growth.....	42
Economic challenges.....	43
4.4. Holistic Approach to Agriculture	44
Integrated farming and resource management	44
Health and nutrition awareness	45
Challenges faced	46
4.5. Economic collaboration and peer learning.....	46
Collaborative marketing.....	46
Knowledge sharing and networking	46
Extent to which education and training in innovation is important for students and entrepreneurs in the holistic agri-food sector.	48
5.0. SWOT ANALYSIS (FROM FOCUS GROUP RESULTS)	51
6. 0. CONCLUSION.....	54

6.1. Key Findings and Implications for a sustainable Agri-food System in Kenya.....	54
Education and innovation as major tools	54
Economic feasibility of sustainable practices	55
Promoting a Holistic Approach	55
Fostering collaboration and Peer Learning.....	56
Addressing Economic Barriers	56
7.0. BIBLIOGRAPHY	58
8.0. APPENDIX	61
Appendix 1: Interview Guide	61
Appendix 2: General Questionnaire.....	77
Appendix 3: Focus Group Plan	84
APPENDIX 4: SOUTH EASTER KENYA UNIVERSITY VISIT	93
The incubation garden hub at SEKU	94
Incubation poultry hub at SEKU.....	96
Livestock-SEKU	97
SEKU INCUBATION LABORATORY	98
Thematic discussions at SEKU	99
Interactive workshops at SEKU	100
KITUI FARM VISIT	101
APPENDIX 5: JOOUST FOCUS GROUP MEETING	106
JOOUST SERICULTURE.....	107
JOOUST INSECTARIUM.....	110
JOOUST AQUACULTURE SECTION (Recirculating aquaculture System).....	112

Abstract

The research study on the Development of a sustainable Agri-food System through Education and Innovation among Small and Medium-scale entrepreneurs in Kenya for Holistic Agriculture, explores how education and innovation tools can address the challenges faced by SME entrepreneurs along the food value chain in Kenya's agri-food sector. Agriculture being the backbone of Kenya's Economy, is dominated primarily by Small and Medium-scale entrepreneurs across the country. They play a pivotal role in the production and supply of healthy food as well as source of employment hence contributing greatly to the achievement of the SDGs such as poverty reduction and zero hunger in the Kenya. Kenya being a medium-income country, the overall food security level of many households in the country depends on the agriculture performance.

Despite the sector contributing greatly to the country's GDP, many agriculture enterprises face significant obstacles including limited access to finance, unfavorable agriculture policy, insufficient necessary entrepreneurial skills and low levels of modern technology adoption. Therefore, the research emphasizes on the need for more relevant education programs and innovation to equip entrepreneurs with skills in sustainable agriculture and foster technological advancements respectively.

Through qualitative methods such as interviews and focus group discussions with the stakeholders (teachers, professors and the entrepreneurs), the study identified key factors including hands-on training, entrepreneurial mentorship and technological innovation as vital for developing a resilient, holistic agricultural system. The findings of the study reveal that addressing financial barriers, improving access to modern technologies, improving entrepreneurial literacy and fostering economic collaboration among stakeholders are vital to enhancing sustainability in agri-food system in Kenya. The study advocates for a multifaceted approach that incorporates education, innovation, economic feasibility, economic collaboration and a holistic approach towards agriculture, to develop a sustainable agri-food system that promotes food security and economic resilience in Kenya.

List of Abbreviations

1. FAO - Food and Agriculture Organization
2. GDP - Gross Domestic Product
3. SMEs - Small and Medium-sized Enterprises
4. IFAD - International Fund for Agricultural Development
5. SDGs- Sustainable Development Goals
6. AGRA - Alliance for a Green Revolution in Africa
7. JOOUST - Jaramogi Oginga Odinga University of Science and Technology
8. SEKU- South Eastern Kenya University
9. IULS - Iasi University of Life Sciences
10. HSWT - Weihenstephan-Triesdorf University of Applied Sciences
11. SEUCO- South Eastern University College
12. KRA- Kenya Revenue Authority
13. KEBS - Kenya Bureau of Standards
14. WFP - World Food Programme
15. NGOs - Non-Governmental Organizations
16. CRS- Catholic Relief Services
17. PPP- Public-Private Partnership
18. ASK- Agricultural Society of Kenya
19. BFT- Bio-floc Technology
20. RAS- Recirculating Aquaculture System
21. CSA- Conservative Agriculture

- 22. P3s- Private-Public Partnership
- 23. R&D- Research and Development
- 24. FAO-The Food and Agriculture Organization
- 25. MSME-Micro, Small and Medium Enterprises

List of Tables

Table 1: <i>Demographic Breakdown of Interview Participants</i>	15
Table 2: <i>Demographic Breakdown of SEKU Entrepreneur Questionnaire Participant Table</i>	21
Table 3: Demographic Breakdown of SEKU Student Questionnaire Participants Table	22
Table 4: Demographic Breakdown of SEKU Professor Questionnaire Participant	22
Table 5: Demographic Breakdown of JOOUST entrepreneur questionnaire participants	22
Table 6: Demographic breakdown of JOOUST student questionnaire participants	23
Table 7: Demographic breakdown of JOOUST professor questionnaire participants	23
Table 8: Entities and representatives who participated in the Focus Group Sessions	26
Table 9: Extent to which education and training in innovation is useful to students and entrepreneurs in holistic agri-food sector	48

List of Figures

Figure 1: Map of study area: Bondo Sub- County, Siaya County-Kenya	10
Figure 2: Map of study area: Kwa Vonz-Kitui County in Kenya	13
Figure 3: sustainable agri-food system cycle.....	30
Figure 4: Frequency of key factors in entrepreneurial thinking stimulation.....	33
Figure 5: Comparison of prioritized entrepreneurial factors.....	34
Figure 6: Distribution of entrepreneurial thinking stimulation factors by frequency	35
Figure 7: Networks in the Holistic Agri-Food Entrepreneurial Ecosystem	35
Figure 8: Frequency of major constraints hindering entrepreneurial thinking.....	36
Figure 9: Frequency of combined constraints appeared together	37
Figure 10: Importance of education and training in innovation for students and entrepreneurs in holistic agri-food sector	49
Figure 11: SWOT Matrix for Developing a Sustainable Agri-Food system	51

1.0. INTRODUCTION

1.1. Problem statement

Agriculture is the backbone of Kenya, mainly dominated by Small and Medium-sized enterprises. According to FAO, agriculture is a key sector to Kenya's economy, contributing 33 per cent of the Gross Domestic Product (GDP) and another 27 per cent of GDP indirectly through linkages with other sectors. The sector employs more than 40 per cent of the total population and more than 70 per cent of Kenya's rural people.

Despite a crucial role that SMEs play in food production and rural development, they face significant challenges in achieving sustainability. They are faced with challenges including socioeconomic factors such as ineffective agriculture policies, lack of mechanization and adoption of innovations, weak access to finance, weakly managed urbanization and population growth. (IFAD *Rural Development Report* 2019, P.10). These challenges hinder the potential for holistic agriculture in the country, which involves economic profitability, social equity and environmental health.

Building resilient and sustainable food systems is crucial to ensuring sustainable economies and achieving the Sustainable Development Goals (SDGs) and Agenda 2063 Goals. (AGRA: *Africa Agriculture Status Report* 2021, p.2). However, the adoption intensity of the sustainable practices among SMEs in Kenya remains low. This is partly due to insufficient educational programs and limited innovation diffusion which has created a significant gap in the dissemination of knowledge regarding sustainable agricultural methods and holistic farming practices.

Cross-country comparisons suggest that a reasonable number of formal firms enter the Kenya economy annually but these businesses exhibit low dynamism in terms of both scaling up and technological upgrading. (World Bank: *Entrepreneurship Ecosystems and MSMEs in Kenya*, p.6). “However, not all businesses have real potential to scale neither are they tech-based. Given that most start-ups ecosystem players and support services such as incubators and shared working spaces are located in major urban areas, which implies that the ecosystem is not evenly spread in Kenya and thus there is still greater potential for start-ups.” Stephane. M. et al. (*Understanding Startups Ecosystem in Kenya: Drivers, Challenges, and Opportunities; Article in Journal of Business and Management Sciences · July 2022 DOI: 10.12691/jbms-10-3-5. p.145*).

Therefore, there's an urgent need to explore how education and innovation tools can be leveraged to address these challenges among SMEs in Kenya hence development of a sustainable agri-food system for holistic agriculture.

1.2. Study Objectives

To address these challenges, the development of a sustainable agri-food system in Kenya requires a multifaceted approach focusing on education and innovation, considering the following key objectives; stimulating entrepreneurial thinking and innovation potential, creating innovation in holistic agriculture, transforming students and entrepreneurs into innovators, transforming businesses in holistic agriculture and finally, transforming innovation ideas into growing businesses.

The Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa project going on in Jaramogi Oginga Odinga University of Science and Technology (JOUST) and South Eastern University (SEKU) in Kenya, is playing a great role in exploring the above-mentioned objectives for sustainable agri-food systems in the country by the help of the researchers at Iasi University of Life Sciences (IULS) in Romania and Weihenstephan-Triesdorf University of Applied Sciences (HSWT). The project aims at fostering innovation in agriculture sector through higher learning institutions for holistic agriculture in Kenya. By addressing these issues through targeted interventions and collaborative efforts, it is possible to develop a sustainable agri-food system that enhances food security and economic resilience among SME entrepreneurs in Kenya.

1.3. Limiting Conditions for the Study

Categorization of entrepreneurs

They are categorized into large, medium and small-scale entrepreneurs. However, the categorization system is highly dependent on the specific policies and business definition of classification in a particular country. For example, a business considered as small-scale business in Germany can be considered as medium-sized business in Kenya. Therefore, contextualized of the classification was assumed respective of the country's policies and standards.

Unwillingness of some of the entrepreneurs to indulge information

Some entrepreneurs were reluctant in sharing information due to some personal reasons which can be concerns about confidentiality, competitive advantage or simply lack of trust in the process. This creates a challenge in gathering comprehensive information from the group.

High Expectations from Entrepreneurs

Some entrepreneurs expected to get compensated for their time and for the information they shared. This posed a challenge especially with a limited budget as well as the policies against compensation for data.

Limited Time for planning and scheduling

Time allocated for whole interview exercise was short. This made it difficult to adequately plan and schedule interviews with entrepreneurs, hence more time needed for planning and booking appointments with entrepreneurs.

Conflicting points among the Focus Group participants

This was due to differing viewpoints which make it challenging to reach a consensus and can implicate data analysis process.

2. 0. LITERATURE REVIEW

According to the *Systems Theory*, agriculture is viewed as a system with different interconnected components such as human, natural and technological elements. The understanding of how changes in one part of the system impacts the whole system helps in designing more sustainable practices. “As the twenty-first century unfolds, it is becoming more and more evident that the major problems of our time – energy, the environment, climate change, food security, financial security – cannot be understood in isolation. They are systemic problems, which means that they are all interconnected and interdependent. Ultimately, these problems must be seen as just different facets of one single crisis, which is largely a crisis of perception.” (Capra, F., & Luisi, P. L. (2014). *The Systems View of Life: A Unifying Vision*. Cambridge University Press.). “The agricultural system is an open system, interacting with nature and with society, and the development of a sustainable food system will require more attention to the efficiency of the entire process of converting natural resources to what reaches consumers’ tables. This includes analysis of food production, processing, marketing, and consumption.” (Charles A Francis, Geir L, & Gliessman R., July 2003) *Journal of Sustainable Agriculture* 22(3):99-118, p.104)

The ecological principles are discussed in depth with an emphasis on the need to view agriculture systems holistically. The interconnectedness among the components and their implications on sustainability are explored. Agroecology is viewed as an alternative way of providing solutions to the global interrelated problems of food security, climate change as well as sustainable development.” In agroecology, we move from a narrow concern with farming practices to the whole universe of interactions among crop plants, soil, soil organisms, insects, insect enemies, environmental conditions and management actions and beyond that to the effects of farming systems on surrounding natural ecosystems.” (Gliessman, S. R. (2015). *Agroecology: The Ecology of Sustainable Food Systems* (3rd ed.). CRC Press).

Altieri M.A, is an author whose work focusses on agroecology with an emphasis on systems thinking in agriculture. He determines how changes in farming techniques can impact the broader agricultural ecosystem. “Agroecology often incorporates ideas about a more environmentally and socially sensitive approach to agriculture, one that focusses not only on production, but also on the ecological sustainability of the production system.” (Altieri, M. A. (1995). *Agroecology: The Science of Sustainable Agriculture* (2nd ed.). CRC Press.) He further

explains the ecological relations in the field whose purpose is to illuminate the form, dynamics and functions of these relations. “Implicit in some agroecological work is the idea that by understanding these processes and relations, agroecosystems can be manipulated to produce better, with fewer negative environmental or social impacts, more sustainably and with fewer external inputs.” (Altieri, M. A. (1995). *Agroecology: The Science of Sustainable Agriculture* (2nd ed.). CRC Press.)

The second theory applied to this research is the *Diffusions of Innovations Theory* developed by Everett Rogers. The theory explains how, why and at what rate new ideas and technologies spread through cultures. It helps in understanding how sustainable farming practices and innovations can be effectively introduced and adopted by SMEs. He explains diffusion as a kind of social change that alters the structure and functioning of a social system. “When new ideas are invented, diffused and adopted or rejected, leading to certain consequences, social change occurs.” (Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press., p.6). Everett further explains the five elements that define the intensity of innovation adoption among the adopter. “Innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, and observability and less complexity will be adopted more rapidly than other innovations. The first two attributes, relative advantage and compatibility, are particularly important in explaining an innovation’s rate of adoption.” (Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.p.16-17). This model was successfully used in San Francisco’s *STOP AIDS PROGRAM*.

“Adoption depends on a range of personal, social, cultural and economic factors, as well as on characteristics of the innovation itself. Adoption occurs when the landholder perceives that the innovation in question will enhance the achievement of their personal goals.” (Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). *Understanding and Promoting Adoption of Conservation Practices by Rural Landholders*. Australian Journal of Experimental Agriculture, 46(11), 1407-1424. p.13) This journal applies the Diffusion of Innovations Theory to adoption of conservation practices among rural landholders, providing insights into how sustainable farming practices can be promoted and adopted. “Innovations are more likely to be adopted when they have a high ‘relative advantage’ (perceived superiority to the idea or practice that it supersedes), and when they are readily trial able (easy to test and learn

about before adoption). “(Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). *Understanding and Promoting Adoption of Conservation Practices by Rural Landholders*. Australian Journal of Experimental Agriculture, 46(11), 1407-1424. p.13).

Adoption is a learning process through which a farmer/entrepreneur has to undergo for a successful innovation adoption decision. It entails two distinct aspects involving “the collection, integration and evaluation of new information to allow better decisions about the innovation.”

And “improvement in the landholder’s skills in applying the innovation to their own situation.”

“(Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006).

Understanding and Promoting Adoption of Conservation Practices by Rural Landholders.

Australian Journal of Experimental Agriculture, 46(11), 1407-1424. p.16). Through education

and innovation training programs on sustainable practices involving practical work, the necessary innovation skills can be established and enhanced among the SMEs entrepreneurs.”

Through learning-by-doing, as well as by reading, listening and watching, the necessary skills can be established and enhanced.” “(Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F., & Wilkinson, R. (2006). *Understanding and Promoting Adoption of Conservation Practices by Rural Landholders*. Australian Journal of Experimental Agriculture, 46(11), 1407-1424. p.16).

“The adoption of innovative technologies in the agriculture sector provides the benefits of transforming the sector into a viable economic impetus and a means of propelling rural development.” (M. Kapari, S. Hlophe-Ginindza, Luxon. N & S. Mpandeli (2003). *Article in Frontiers in Sustainable Food Systems* · July 2023 DOI: 10.3389/fsufs.2023.1149854. p.02). “The challenges of low productivity and poor uptake of technologies by smallholder farmers are being exacerbated by that they are cut off from the larger economy and key agricultural value chains by a poorly functioning rural economy with underdeveloped infrastructure, tenuous market ties, and inadequate agricultural support services (ILO, 2008 as cited in M. Kapari, S. Hlophe-Ginindza, Luxon. N & S. Mpandeli, (2003). *Article in Frontiers in Sustainable Food Systems* · July 2023 DOI: 10.3389/fsufs.2023.1149854. p.2).

Most of SMEs entrepreneurs try hard to adopt to new innovation technologies available in the country so as to promote sustainable practices through practicing organic farming as well as conservative agriculture which includes crop rotation, mulching and many other practices. Despite their efforts, they face limitations in further engaging in these practices due to various

major challenges including limited access to finance, low levels of sustainable agriculture and knowledge. “However, major challenges facing smallholder farmers are financial availability, access to information and farm size. These hinder smallholder farmers’ ability to contribute to food security. As such, authors have recommended policy intervention, knowledge dissemination and capacity building as possible measures to get smallholder farmers on the right path to sustainable food production and CSA practices uptake.” (M. Kapari, S. Hlophe-Ginindza, Luxon. N & S. Mpandeli (2003). *Article in Frontiers in Sustainable Food Systems* · July 2023 DOI: 10.3389/fsufs.2023.1149854. p.01). This implies that SMEs entrepreneurs with access to relevant education and training on sustainable practices have higher chances of adopting sustainable agriculture practices such as modern irrigation, crop diversification to curb climate change impacts and soil conservation.

According to S.J. Smyth et al. *Global Food Security* 31 (2021) 100588, they highlight the importance of various Public-Private Partnerships in establishing more efficient and effective agricultural R & D investments and innovations in food production and food systems as a whole through reduction of costs and risks incurred by individual (cost and resource sharing). “In a report that analyzed 125 P3s in 12 Latin American countries, Hartwich et al. (2007) as cited in S. J. Smyth et al, (2021) identify that P3s are not always the most appropriate mechanism to undertake agricultural R&D and promote innovation, but they can provide unique advantages. Hartwich et al. (2007) as cited in S.J. Smyth et al. *Global Food Security* 31 (2021) 100588. P.5) conclude that P3s can help to:

1. reduce the costs and risks entailed in research;
2. improve the quality and relevancy of research results due to synergies among the partners, and ensure greater adoption by user groups;
3. improve accumulation of complementary abilities, skills, and resources;
4. develop higher competitiveness and better market positioning as a result of improved competencies; and
5. promote development and poverty reduction by providing small-scale farmers with access to knowledge and technologies.”

The collaboration among the universities, researchers, entrepreneurs and students, need to be strengthened to ensure easy and quick dissemination of researched information down to the intended recipient at appropriate time. Many SMEs entrepreneurs fail to access new technologies for sustainable practices on time due to weak dissemination system. This can be improved through Public-Private collaboration among the stakeholders. “Moving downstream, new technologies and varieties emerging from research collaborations need to be taken up and used. In many ways the early land-grant university model was a nascent partnership, as many of the resulting varieties, technologies and agronomic approaches were handed off to local seed merchants to disseminate to farmers. More recently, multinational firms and public breeding programs partner with government extension programs and commodity groups to facilitate rapid adoption and diffusion. New P3s are emerging all the time to test markets with new ways to differentiate and market food ingredients and products. In some cases, these are no more than supply chain contracts, but many have deeper engagement and are more enduring.” (S. J. Smyth et al. *Global Food Security* 31 (2021) 100588. P.5).

Financial constraint is one of the major economic barriers that need to be addressed in order to enhance the investment in new agriculture technologies and innovations, as well as training programs on sustainable practices, along the food value chain among SMEs entrepreneurs for sustainable and resilient agri-food systems in Kenya. The high costs and collateral requirements associated with credit acquisition are unfavorable to Small and Medium-sized entrepreneurs hence hindering the smooth expansion and transformation of the existing businesses holistically. “Limited access to credit due to the lack of collateral hampers capital accumulation especially among nascent entrepreneurs in African countries, where financial frictions stem, broadly, from weak legal frameworks and limited transparency in financial accounting. The analysis shows that the constrained access to credit and hence to investment capital, which can emerge even when the financial sector has liquidity, is a binding impediment to entrepreneurship.” (Z. Brixiova et.al. (2020) *Access to finance among small and medium-sized enterprises and job creation in Africa*). “In addition, MSMEs indicated difficulty in accessing credit, whether formal or informal, attributing this to challenges in obtaining / preparing documents that lenders need, poor financial position of the borrowers and lack of collateral.” (Kenya Bankers Association; *Micro, Small & Medium Enterprises Survey Report 2021*).

Small and medium scale entrepreneurs have limited access to markets for their agricultural products. This makes it difficult for consumers in other regions to continuously access to fresh, healthy and sufficient food for their families. It also poses losses to entrepreneurs especially when highly perishable goods are involved as most of them have no access to good storage facilities like cooling storages. SMEs producers being the majority of the producers in the country, facing these challenges, weaken the food supply chain hence unsustainable agri-food system. Food systems that link SMEs entrepreneurs to outlet shops enhance market accessibility and the balanced and resilient food supply systems across the country. “Options include connecting small-scale producers and supermarket supply chains through contractual arrangements with mutually beneficial terms, and giving new impetus to the development of local food systems.” (FAO 2017, *The future of food and agriculture*.p.141).

3. 0. MATERIAL AND METHODS

3.1. Study Area

The data collection was conducted in two agriculture universities in two different counties in Kenya. JOOUST is one of the universities in Kenya of science and technology. It was named after Kenya's first vice-president Jaramogi Oginga Odinga and the Vice-Chancellor is Prof. Emilly Achieng Akuno. It is a public university located in Bondo town in Siaya County, approximately 62 Km by road, west of Kisumu city. The university lies between $0^{\circ}05'38.0''\text{S}$, $34^{\circ}15'31.0''\text{E}$ (Latitude: -0.093889; Longitude:34.258611).

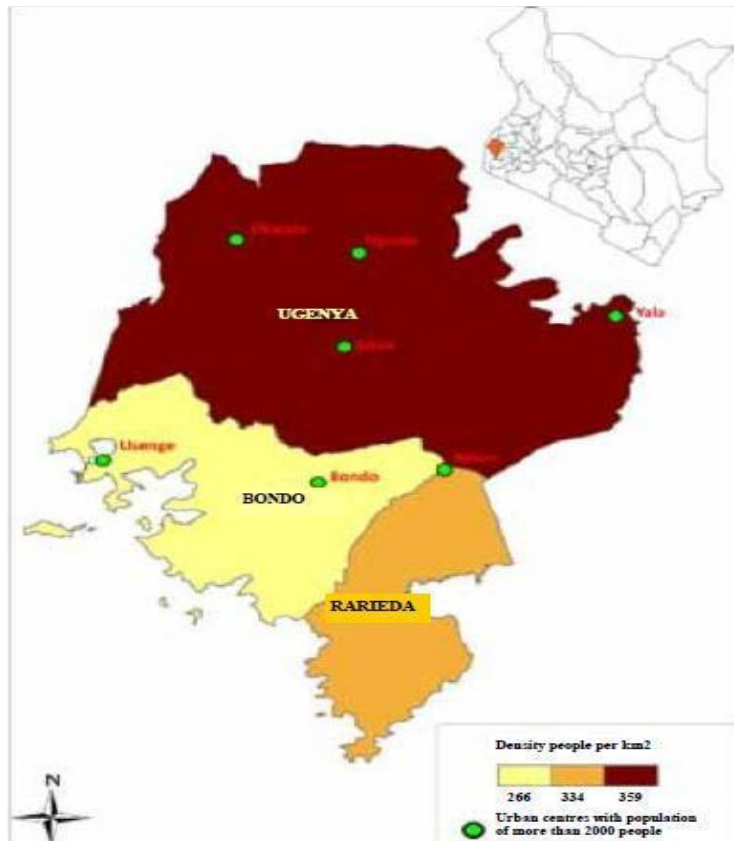


Figure 1: Map of study area: Bondo Sub- County, Siaya County-Kenya

The university comprises of schools, institutes and centers.

School of Agricultural and Food Sciences, School of Biological & Physical Sciences, School of Business & Economics, School of Education, School of Engineering and Technology, School of Health Sciences, School of Humanities & Social Sciences, School of Informatics & Innovative Systems, School of Mathematics and Actuarial Sciences, School of Spatial Planning and Natural Resource Management.

Institutes;

Institute of Cultural Heritage and Material Science, East African Community Integration Institute.

Centers

Center for Research Innovation and Technology, Gender Mainstreaming and Development, Outreach and Extension Services, Centre for E-Learning and Africa Center of Excellence in Sustainable Use of Insects as Food and Feeds (INSEFOODS).

JOOUST was an ideal area for study as far as this research is concerned due to its focus on nurturing a culture of scientific exploration, technological innovation, and academic excellence. “Jaramogi Oginga Odinga University of Science and Technology has maintained her sterling performance at the ASK Kisumu Regional Show with committing signs of not dropping any soon. This has been witnessed in the just concluded ASK Kisumu Regional Show 2023 that ran between 24th -30th July 2023 where JOOUST has been crowned The Best Stand that Interprets Show Theme through Education and / or Research, Best Organization/Association in Community Projects /Services Stand and The Best University Stand.

The University showcased Research projects and Innovations that resonated well with this year’s show theme: Promoting Climate Smart Agriculture and Trade Initiatives for Sustainable Development. The University entered into six (6) Trade Exhibition classes namely: The Best Stand that Interpret the Current Show theme; The Best University Stand; The Best Stand in Research and Development; The Best Innovation and Invention Stand; The Best Organization/Association in Community Projects/Service Stand; The Best Stand Demonstrating the Application of Environmental Quality Standards.

Apart from leading in the three fore-mentioned categories, the University also emerged 2nd position under the category; The Best Stand Demonstrating the Application of Environmental Quality Standards, and third position under the category of The Best Innovation and Invention Stand and The Best Stand in Research and Development.

Exhibits that drew the attention of the public at JOOUST Stand included the Innovation on 1.) Seed dispensing robot with smartphone control (Seedbot) which is an automated android based smart farming assistant designed to enhance seed dispensation via remote control from the comfort of an android. The device navigates through terrain dispensing seeds at intervals of 30 cm spacing automatically and manually, a project presented by the School of Biological and Physical, Mathematics and Actuarial Sciences. 2.) Floconic Technology; a technology that integrates biofloc-based aquaculture with an aquaponic system. It is an integrated agri-aquaculture system that combines the beneficial fungi, bacteria, planktons, aquatic animal and vegetable productions. The Floconic systems maximizes the advantages of biofloc technology (BFT) and traditional aquaponics using recirculating aquaculture system (RAS), just to mention but a few.” (JOOUST University News, 01/08/2023).

South Eastern University

South Eastern Kenya University "SEKU" is a public university with its main campus located in Kwa Vonza, Kitui County, Kenya.

It was formerly South Eastern University College "SEUCO", a constituent college of The University of Nairobi prior to its award of Charter in 2013. The Vice Chancellor of SEKU is Prof. Eng. Douglas Shitanda. Its main campus sits at approximately latitude 1.3833° S and longitude 38.0167° E12.

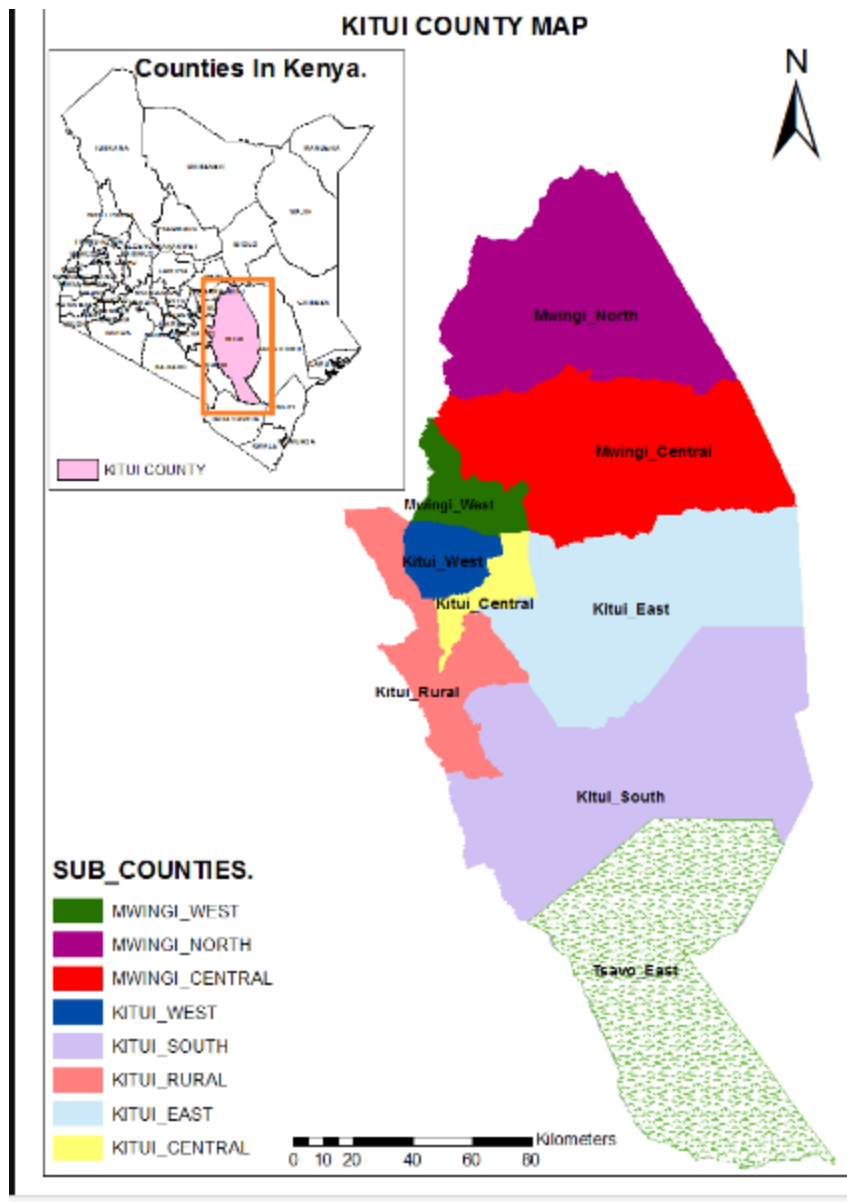


Figure 2: Map of study area: Kwa Vonza-Kitui County in Kenya

***Kwa Vonza** is a highly populated market town in Kitui County, Kenya to the west of Kitui town, along Kitui - Machakos road.*

It is a fully fledged University and is the successor to the South Eastern University College (SEUCO) which was a Constituent College of the University of Nairobi. The University has undergone tremendous growth since inception in 2008. The current student population stands at around 8,000 students. The University is a premier institution of higher learning in the region

offering various certificate, diploma and degree programmes. SEKU envisions becoming a World Class University with quality teaching, creative learning, innovative research and strong community outreach. The university's mission is to provide quality education through teaching, research, extension, innovation and entrepreneurship with emphasis on dry land agriculture, natural resources and environmental management. It consists of various faculties and research centers. The Research and Innovation centers offers competitive programs which grant students opportunities to learn world trends in technology and globalization.

3.2. Research Design

The data collection method used was qualitative method where interviews, questionnaires and focus group discussions were conducted. The method was suitable simply because it provides in-depth insights into human behavior, experiences, and social processes that are essential for this research. (How to Use Qualitative Methods in Evaluation, Michael Quinn Patton, p.9). The study of entrepreneurship education in regards to innovation involves the process of identifying and understanding the behavior of the community and the actors across the value chain. (Journal of Business Venturing, Volume 17, Issue 5, September 2002, Pages 387-395). Understanding the complex phenomena and human experience in agriculture sector keeping in mind the aspect of climate change, which has resulted into high food insecurity levels due to poor agri-food systems in the country. These methods also prioritize the perspectives and voices of participants, providing an opportunity to hear directly from those being studied. By giving participants, a platform to express their views in their own words, qualitative research empowers individuals and communities. Therefore, the qualitative method was ideal for this research topic.

Participants

The researched sample consisted of at least 30 people per university consisting of teachers/professors, students and entrepreneurs from within different origin. 20 of the participants were agri-food entrepreneurs identified according to their position on the agri-food product chain and their economic size.

- The entrepreneur's selection was further made based on various criteria;

A). An agricultural production (vegetable farms, animal farms, poultry, bees, fish farms, vegetables, fruits, etc.):

b). Processing of agricultural products (workshops and factories processing milk, meat, vegetables, fruits, etc.):

c). Commerce and other services (shops, restaurants, guesthouses, etc.):

This sample structure was relevant to the interview objectives because:

- the entrepreneurs from the three links of the agri-food chain know the problems of the entrepreneurial environment and the necessary skills in this field;
- teachers have information based on scientific research regarding the agri-food sector and the skills necessary for employment and entrepreneurship in this sector;
- students can provide a fresh perspective on the difficulties and opportunities they see in this field.

The structure of the sample is indicative and could be changed within the limit of 10-20% of each category. This accommodated a room of some relevant changes especially where certain size category was more relevant in the particular region or where there was a necessity of the introduction of another link in the agri-food product chain.

Table 1: *Demographic Breakdown of Interview Participants*

Category	No. participants	Comments
Entrepreneurs (Small Scale)	12	Small scale entrepreneurs focusing on mixed farming
Entrepreneurs (Medium Scale)	6	Medium scale entrepreneurs focusing on organic farming
Entrepreneurs (Large Scale)	2	Large commercial farms with modern technology
Professors (Agri-Food Technology)	2	Experts in food technology and sustainability
Professors (Economy)	1	Economy and finance specialists in agriculture
Professors (Marketing)	2	Marketing in the agri-food value chain
Students (Final year agri-food majors)	5	Final year students specializing in agriculture

3.3. Data Collection Methods

The proposed methodology worked in a “cascade” where each stage used the results of the previous stage. The questionnaires used the results from the interviews while the Focus group used the questionnaires’ outcome for detailed and comprehensive results.

Interviews

Semi-structured interviews with indicative questions, were conducted to allow the flexibility while covering the key topics. This also facilitated a two-way communication between the interviewer and the interviewee hence enabling the interviewees to present their thoughts well and feel motivated.

Objectives of the interview:

a) Entrepreneurs

The aim was to identify the main skills and difficulties of businesses in the agri-food sector in Kenya. The determinants of sustainable performance appear to be management commitment that influences environmental and social performance on the one hand, and green entrepreneurial orientation that predicts financial performance on the other. (E. Yadegaridehkordi et al. 2023). The responsible agribusiness entrepreneur from a socio-economic and environmental perspective is characterized by environmental concern and regulation; knowledge and technological development, networking and collaboration and knowledge, resources and skills. (U. Tamayo-Orbegozo et al., 2017).

The perspectives followed in the interviews with the entrepreneurs were natural, demographic, psychosocial, historical, economic, cultural, legal, political and institutional. The interview responses included some short stories about the effect of measures and changes in the entrepreneurial climate in Kenya.

b) Teachers/Professors

The aim was to outline the general climate specific to entrepreneurship in the agri-food sector and the main skills needed for the development of holistic agriculture.

The vectors of holistic development of the agri-food ecosystem need idealized influence, intellectual stimulation, inspirational motivation and individualized consideration. Basically, they need specific transformational collaboration to build pro-environmental behavior and promote sustainable performance. (M. Shoaib et al., 2022) University teachers, in the didactic process and in professional relations with the economic environment, stimulate, motivate and inspire socio-economic actors in a specific way. They strongly feel the pressure given by research objectives in the direction of sustainable development and didactic objectives. This tension leads to the increase in the quality of the teaching process and the transfer of research results in the economic environment. (T Schubert et al., 2023).

The sketching of the general climate specific to entrepreneurship in the agri-food sector was carried out according to the frameworks (perspectives) targeted at the interviews with the entrepreneurs. However, the general approach was the subjects to direct the discussion to the specialist aspects. The general orientation was based on the components of the SWOT analysis; highlighting the internal factors of the agri-food system - strengths and weaknesses in the holistic perspective and highlighting external factors - opportunities and threats impacting the development of holistic agriculture.

Competencies were discussed from the perspective of the current level and structure of the competencies that university graduates have acquired and the specialized competencies needed to become promoters of holistic agriculture.

c) Students

The goal was to identify the main difficulties for employment and entrepreneurship in the agri-food sector.

The specific actions from the offer intended for young people from rural areas, include actions to facilitate the skills of young people, the development and matching of young people from rural areas with jobs, facilitating the access of young people from rural areas to land, improving access to affordable financing by rural youth, promoting the development of SMEs and supporting social protection and safety net programs and access to social services (RURAL YOUTH EMPLOYMENT, 2017, World Bank and IFAD at the request of the German Federal Ministry, for Economic Cooperation and Development).

The success factors of the inclusive development of the value chain assume the careful diagnosis of the competitiveness and sustainability of the value chain per product, the involvement of financial institutions, the monitoring of producer-buyer relations and the support of capacity development (L. Christiaensen et al., 2021). Students' willingness to engage in entrepreneurial activities is influenced by a number of factors such as public policy support, entrepreneurial education, social support, and the perception of their own cognitive level (Y. Huang et al., 2023). Challenges identified in previous research include entrepreneurial training, government support, funding, competition and the cost of doing business (Youth Entrepreneurial Ecosystem for Sustainable Development in Sub-Saharan Africa).

The interview with the students was structured on the questions in the guide to encourage and support their effort to analyze the issue of unemployment and low entrepreneurship levels in the agri-food sector in Kenya.

The general structure was based on the components of the SWOT analysis; highlighting the internal factors related to the students' skills - strengths and weaknesses and determining the external factors - opportunities and threats with an impact on access possibilities in this sector. During the interview, the knowledge and attitude was keenly observed.

Format of Conducting the Interview

To ensure confidentiality of personal data, comfort and better responsiveness of the interviewees, the interviews were conducted face-to-face in a private setting at each university and some at their premises.

To support field research, interview guides specific to each subject category (students, entrepreneurs and teachers), were developed that included guiding questions on interview objectives and explanations of how, when and where to conduct this activity. At the beginning of each interview, the subjects were informed of the reason of the data collection and the way in which the collected data will be used. The respondents were also asked to consent to the use of their information. The confidentiality of their personal data was also well elaborated to them before the interview, where the publication of the information will be done without mentioning of individuals' personal data.

Questionnaires

Quasi questionnaires (mixed questionnaires) were used where a combination of open-ended and closed-ended questions were included. These questions were developed from the results of the interviews conducted earlier. The aim was to identify specific needs, constraints and methods to stimulate entrepreneurial thinking within the holistic agri-food context for a sustainable food system.

The questionnaires also highlighted the perspectives of students, researchers, teachers and entrepreneurs on the challenges and opportunities in the holistic agri-food sector in Kenya, identify the effective solutions and strategies to stimulate innovation and sustainable development in the country.

Questionnaire objectives

- I. Identifying the needs, constraints, and methods for fostering entrepreneurial thinking.
- II. Identifying ways to stimulate innovation potential.
- III. Collaborating in holistic agri-food innovation.
- IV. Identifying needs and motivations for innovation.
- V. Identifying needs and opportunities for transforming conventional businesses into holistic agri-food businesses.
- VI. Identifying innovations with transformation potential

The reason for using questionnaire in this research, is that it allows the respondents to go and look up information, read the questions over and over which potentially increases the accuracy of their responses. (Research Methods in Palliative Care, edited by Julia M Addington-Hall, Eduardo Bruera, Irene Higginson, Sheila Payne, p.63)

Sample Structure

The surveyed sample consisted of three categories: entrepreneurs, students, and professors/researchers.

The sampling method employed was Proportional Stratified Sampling, where a proportional part of respondents was selected from each stratum based on the size of each stratum in the total population. This ensures that each group is adequately represented relative to its importance in the population.

The size and structure of the samples were determined based on statistical data from statistical yearbooks (2022) from each country.

A challenging issue arises with the representation of women in these samples. Women have reduced representation in the total population of entrepreneurs, students, and professors/researchers. However, understanding the impact of this variable is crucial, and therefore, a consensus was reached to allocate a 30% share of all samples to women.

The arguments used are presented below:

Equity and Representativeness: Employing a quota for women supports the principle of fairness, ensuring that women's voices are heard in research, even in fields where they are underrepresented. This is justified by international commitments to gender equality, such as the United Nations' Sustainable Development Goals (SDGs), which promote gender equality and the empowerment of all women and girls (UN Women), (UN Sustainable Development Goals) (Franceschet S. et al. 2024).

Gender Policies and International Norms: Utilizing a quota reflects the need to uphold international commitments on gender equality, such as those stipulated by the UN, which emphasize the importance of reducing gender inequalities in workforce participation and leadership positions (UN Women) (UN Sustainable Development Goals).

Data Validity and Depth: Including an adequate percentage of women in the study enhances the validity and relevance of the data, providing a more comprehensive picture of the issue under investigation. Women often experience different barriers and challenges, and understanding these is important for formulating effective policies (UN Sustainable Development Goals) (UN Women).

Cultural and Social Impact: Recognizing unpaid work and domestic responsibilities, predominantly performed by women, requires adequate representation of women in research to

shed light on these often-overlooked aspects. The argument is based on the need to change traditional gender roles and promote equitable redistribution of labor (UN Women, 2022; Krook ML., 2006).

Therefore, the following distinct samples were obtained and distributed across universities:

South Eastern Kenya University – SEKU

a) Entrepreneur Sample size

Category	No. participants	Female	Male	Details
Small Scale	42	13	29	Agricultural Production
large scale	16	5	11	Agricultural Production
Small scale	4	1	3	Agriculture Product Processing
large scale	2	1	1	Agriculture Product Processing
Small Scale	8	2	6	Trade & other agricultural Services
large scale	2	0	2	Trade & other agricultural Services
Total	74	22	52	

Table 2: *Demographic Breakdown of SEKU Entrepreneur Questionnaire Participant Table*

b) Student Sample size

Category	No. participants	Female	Male	Details
Undergraduate Students	93	28	65	Majoring in Agriculture Production
Master students	33	10	23	Majoring in Agriculture Production
Doctoral Students	7	2	5	Majoring in Agriculture Production
Undergraduate Students	9	3	6	Majoring in Agricultural Product Processing
Master students	3	1	2	Majoring in Agricultural Product Processing
Undergraduate Students	17	5	12	Majoring in Trade & Other Agricultural Services
Master students	7	2	5	Majoring in Trade & Other Agricultural Services
Doctoral Students	3	1	2	Majoring in Trade & Other Agricultural Services

Total	172	52	120	
--------------	------------	-----------	------------	--

Table 3: Demographic Breakdown of SEKU Student Questionnaire Participants Table

c) Professor Sample size

Expertise Category	No. participants	Female	Male
Agri-Technology	4	4	0
Economics & Business Management	10	3	7
Food Science & Nutrition	7	2	5
Social, Behavioral & Other relevant Sciences	10	3	7
Total	31	12	19

Table 4: Demographic Breakdown of SEKU Professor Questionnaire Participant

Jaramogi Oginga Odinga University of Science and Technology – JOOUST

a) Entrepreneur Sample size

category	Firm Size	Female	Male
Agricultural Production	Small	12	30
	Large	4	11
Agricultural Product Processing	Small	1	2
	Large	0	2
Trade and Other Services	Small	3	6
	Large	1	1
Total		21	52

Table 5: Demographic Breakdown of JOOUST entrepreneur questionnaire participants

b) Student sample size

Area of specialization	Educational Level	Female Students	Male Students
Agricultural Production	Undergraduate	28	66

	Master's	10	24
	Doctoral	2	4
Agricultural Product Processing	Undergraduate	2	6
	Master's	1	2
	Doctoral	1	1
Trade and Other Food Services	Undergraduate	6	12
	Master's	2	4
	Doctoral	1	2
Total		53	121

Table 6: Demographic breakdown of JOOUST student questionnaire participants

c) Professor Sample size

Expertise Area	Female	Male
Agriculture and Agri-Technology	3	8
Economics and Business Management	3	7
Food Science and Nutrition	3	6
Social Sciences, Behavioral Sciences, and Other Fields	3	7
Total	12	28

Table 7: Demographic breakdown of JOOUST professor questionnaire participants

Focus Group

Group discussions were organized using SWOT analysis framework, concentrating on two main areas: Weaknesses and threats, as well as strengths and opportunities. For each of these categories, participants were asked to suggest potential actions.

Focus Group discussion Objectives

- Identification of needs, constraints, and specific methods to stimulate entrepreneurial thinking
- Identification of needs, constraints, and specific methods to stimulate innovation potential

- Analysis of the potential to create innovations in a triadic relationship between researchers, students, and entrepreneurs in holistic agriculture
- Analysis of the potential for students and entrepreneurs in agriculture to become innovators in holistic agriculture
- Analysis of the potential for transforming businesses in holistic agriculture
- Exploring the potential for innovations to evolve into growing businesses

INSTITUTION	DESCRIPTION	PROPOSED INSTITUTIONS
1. Banks:	A credit officer or portfolio manager specializing in agricultural finance, who understands the risks and opportunities associated with sustainable agriculture investments.	ABSA Kitui Branch Manager
2. Government and Regulators:	An agricultural policy analyst or official who develops regulations, programs, and grants to support sustainable agriculture at the national level.	County Executive Member, Agriculture, KITUI County and County Director of Agriculture (Kitui).
3. NGOs:	A project manager or program director who coordinates rural sustainable development initiatives and has direct experience working with farmers and communities.	Projects' Coordinator, CARITAS, Catholic Diocese of Kitui,
4. Universities and Research Institutions:	A researcher or professor specializing in sustainable agriculture, with expertise in innovative holistic farming methods.	Chairperson, Department of Environmental Science and Land Resources Management SOUTH EASTERN KENYA UNIVERSITY.

5. Producers and Farmers:	An innovative farmer or leader of an agricultural association interested in or already implementing holistic practices.	
6. Consumers:	A representative from a consumer protection organization or a consumer behaviour consultant who can offer insights into the demand for sustainable agricultural products.	
7. Supply Chain Companies:	A procurement or logistics manager from an agri-food company interested in building efficient and sustainable supply chains.	CEO MAKAMITHI AGROVET
8. Investors and Investment Funds:	An analyst or fund manager familiar with the agricultural market, interested in investing in socially and environmentally impactful projects.	Equity Bank, Kitui Branch,
9. International Organizations:	A representative of organizations like the FAO or the World Food Programme, with experience in promoting holistic agriculture globally.	WFP-Nairobi Field Office
10. Church:	A religious leader or representative of a church-affiliated charity organization promoting environmental and community care values.	Deputy Director CARITAS, Catholic Diocese of Kitui And Chief Executive Officer
11. Cultural Institutions:	A curator or program director from an agricultural museum or cultural	

	centre, who can highlight the connection between traditions and sustainable agriculture.	Expert, Culture-agrobiodiversity & food-nutrition National Museum of Kenya (NMK).
--	--	--

Table 8: Entities and representatives who participated in the Focus Group Sessions

Conducting the Focus Group Session

The discussion sessions were carried out in two phases: Thematic Discussions followed by Interactive Workshops. The discussion sessions were conducted in a manner that ensured the engagement of all participants. The non-verbal language was observed from each participant. Each objective was guided by simplified questions for easy understanding and quick response.

To guarantee transparency and the protection of personal data during the focus group sessions, each participant was informed about how their information would be used and safeguarded. Before the kick off of the discussions, the participants signed an informed consent form that explained the purpose of data collection, its intended use and their rights under current data protection laws.

Thematic Discussions

All representatives took part in the Thematic Discussions. Each objective was discussed for about 15 minutes. Participants' responses were sought for each objective, and the rapporteur (a researcher moderator from the host university team & IULS), documented participants' responses using key words. The table was projected and completed during the discussions then corrected and filled in real-time.

Interactive Workshops

Thematic discussions were conducted in three different groups where each group was allocated two objectives to tackle. Below are the members of each group:

Group 1: Innovation and Policy:

1. Government or Regulatory Authority Representative
2. University or Research Institution Representative
3. NGO Representative
4. Banking Representative

Group 2: Implementation and Market Impact:

1. Producers and Farmers Representative
2. Procurement or Logistics Manager from an Agri-food Company
3. International Organization Representative
4. Investor or Investment Fund Representative

Group 3: Community and Culture:

1. Religious Leader or Charity Organization Representative
2. Consumer Representative
3. Cultural Institutions Representative

Each objective was allocated approximately 15 minutes and the responses were solicited from participants at each objective. Each team included a rapporteur (a researcher/moderator from the host university & IULS) who recorded the responses of each participant noting keywords and conclusions.

SWOT Matrix Development

The SWOT matrix was developed from the analysis of the qualitative data (feedback and suggestions) of the Focus Group discussions conducted, where the participants discussed the

factors influencing the development of a sustainable agri-food system among Kenya's SMEs entrepreneurs.

The Focus Group outcomes were categorized under each SWOT component depending on their impact(s) and how they pose(internally/externally) towards the development of a sustainable agri-food system in the country. The category identification depended on the internal advantages(strength), internal limitations(weaknesses), favorable external factors(opportunities) and finally, external risks(threats). This matrix approach helped in identifying strength and opportunities available, that SMEs entrepreneurs could exploit for the development of a sustainable agri-food system while strategically addressing the identified weaknesses and putting across the mitigation measures in preparation for the associated potential risks(threats).

Observation

During data collection, I engaged with SME entrepreneurs in Kenya's agri-food sector in both universities' agriculture hubs in order to understand how education programs and innovation contribute to the development of sustainable practices in holistic agriculture. The university agriculture hubs had different businesses like insectarium, sericulture, aquaculture and many more where young entrepreneurs involved in different activities along the chain.

The context of the study mainly focused on how SME entrepreneurs implemented practices that aimed at making their operations more sustainable along food value chain. Key areas of focus were education and knowledge sharing practices among SME entrepreneurs, the adoption of the available simple technologies and how these factors contributed to holistic agriculture approach considering environmental, social and economic sustainability in agri-food system.

Education and knowledge sharing

How entrepreneurs were responding to new information about holistic agricultural practices.

Identifying if there were any knowledge-sharing networks among SMEs, and how they were being used to promote sustainability.

Innovation technologies adoption

The type of agriculture innovation technologies used in these hubs among young entrepreneurs

How these innovations were introduced to SMEs (e.g., through education, peer influence, or government programs).

The challenges do SMEs face in adopting or scaling these innovations (e.g., financial, technical, or cultural barriers)?

How they integrated traditional knowledge with modern innovations available to ensure sustainability.

Holistic agriculture practices

Environmental Sustainability:

How the farming methods like crop rotation and organic used, align with education and innovation initiatives and how environmentally friendly they are.

Economic and Social Dimensions:

How the Kenyan education system prepare entrepreneurs to handle the economic aspects of sustainability.

4. 0. RESULTS AND DISCUSSION

Development of a sustainable agri-food system through education and innovation among SME entrepreneurs for holistic agriculture is an integrated and multifaceted approach that involves various dimensions for effective system. The study offers insights on how education and innovation tools contribute to the development of a sustainable agri-food system in Kenya among the SME entrepreneurs who are closely linked to producers and familiar with the tastes and preferences of local consumers. With emphasis on the role of education, innovation, economic feasibility, economic collaboration and the holistic agricultural approaches, the following results were obtained.

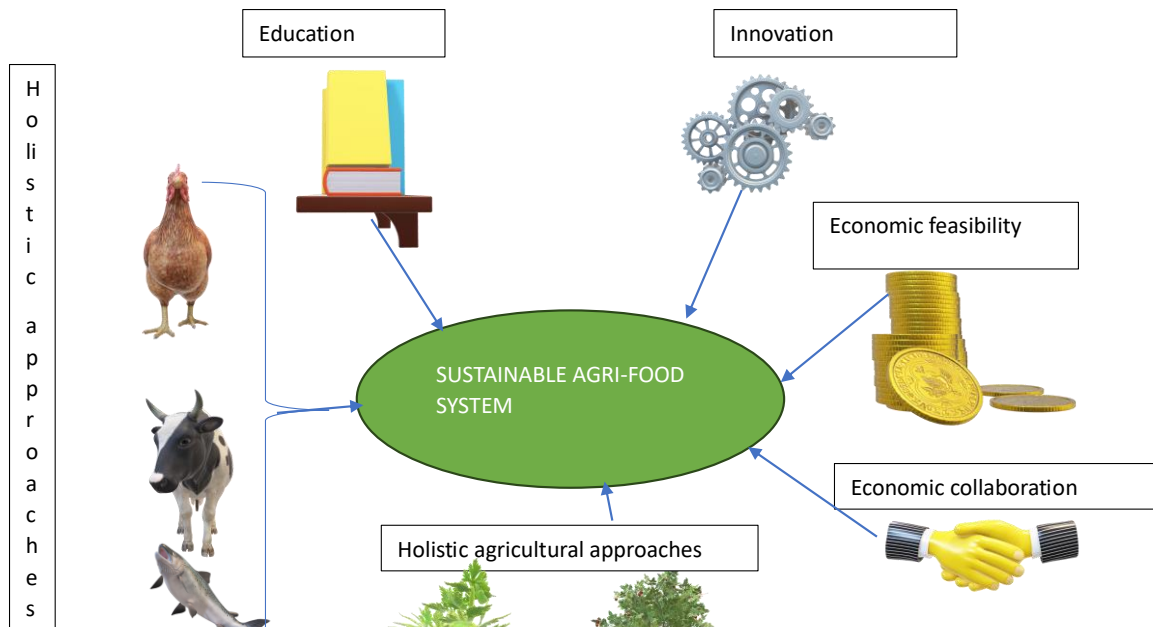


Figure 3: sustainable agri-food system cycle

4.1. The role of Education in promoting Sustainability

Entrepreneurial skills and training

Education is a very crucial tool in stimulating entrepreneurial thinking by equipping entrepreneurs with necessary skills and knowledge to innovate sustainably within the sector. The emphasis is placed on the skills-based training, mentorship and practical internships that teach strategic thinking. These equip the individuals with necessary technical, managerial and entrepreneurial skills. The school curriculum with agriculture courses focusing on agribusiness management, food security and value addition are important in building knowledge for sustainable practices. Some of the students had the following responses.

“Skills-based training, doing a lot of research in the field, mentorship on different aspects of the field, and improving job performance.”

“I am taking a course in Agribusiness Management and I have knowledge in strategic thinking, leadership, and teamwork. At the same time, I have skills in business acumen. Through my studies, I have also acquired the ability to recognize and help customers. The ability to solve problems. I have also developed persuasion capabilities. Agribusiness management lectures have made me able to do quantitative analysis and it has also improved my verbal and writing skills. All of this can improve my chances of getting employed in any sector along the value chain of agricultural production.”

“I'm knowledgeable and skilled in the field of the agri-food sector because of the course I'm pursuing in my bachelor's degree, BSc Food Security. I gained experience since I did my industrial attachment in an organization in the agri-food sector.”

“I have the knowledge regarding the agri-food sector on how it works from production to consumption, because of my bachelor's degree in food security. I have been involved in most practicals that are related to the agri-food sector such as farming in the university farms. I have the experience of running a business that relates to the agri-food sector (mulberry beverage production).”

Innovative Agricultural Education

Incorporating innovative methods, such as hands-on learning, problem-solving and practical experience, plays a significant role in training future entrepreneurs. This approach nurtures an entrepreneurial mindset and helps students understand business concepts in the agri-food sector. The following were some of the responses from the professors regarding what the graduates should be equipped with for future employment.

“The introduction of competency-based curriculum which includes agriculture (practical) to equip the young minds on the importance of agriculture for food security”

“Competencies: 1. Entrepreneurial skills/mindset; 2. Innovative Approaches to Agricultural education; 3. Practical (Hands-On) problem solving skills.”

“Yes, the reception of the innovation by the locals. Due to the evidence-based approach that we use, the locals have now been able to embrace the knowledge about the extraction of fibres hence we have trained a few ToTs amongst themselves who are now village champions to be able to train more farmers about the process.”

Despite the crucial role played by education in fostering sustainability within Kenya’s agri-food sector, few gaps were identified during the study in practical training and educational opportunities, especially in the development of hands-on experience and entrepreneurship. The weaknesses in the current agricultural curriculum, which is often misaligned with industry needs, were identified. Many entrepreneurs lack financial literacy and technical knowledge, limiting their ability to manage sustainable practices effectively.

Key outcomes from the Focus group show a growing need for skills-based training (practical oriented school curriculum), mentorship programs and capacity building in areas like climate risk management, gender equity, and good agronomic practices. Institutions are essential in providing exposure to modern agricultural technologies and techniques for value addition. However, the government's failure to recruit and train adequately contributes to the shortage of skilled labor, limiting the effectiveness of sustainability initiatives.

“Threats: Inadequate Human Resource development for the sector; Irrelevant Agricultural Curricular content; Declining interest cum motivation for Agricultural related degree programmes (Solution: Turning these threats into opportunities).”

“The support system for small-scale farmers who are the majority is still very low. Holistic Agriculture requires adequate training/capacity building on what constitutes holistic farming, and the means to achieve it.”

“Need of experienced employees who have much practical experience. Failure of government to recruit new employees.”

Entrepreneurial Thinking Stimulation among SMEs Entrepreneurs

The study identified major factors in fostering entrepreneurial thinking among SMEs entrepreneurs in Kenya according to the questionnaire results. These themes were also frequently highlighted in our previous qualitative methods used (interviews, focus groups). The histogram below shows key factors highlighted frequently by the questionnaire participants with access to financing being the most frequently cited one among the rest.

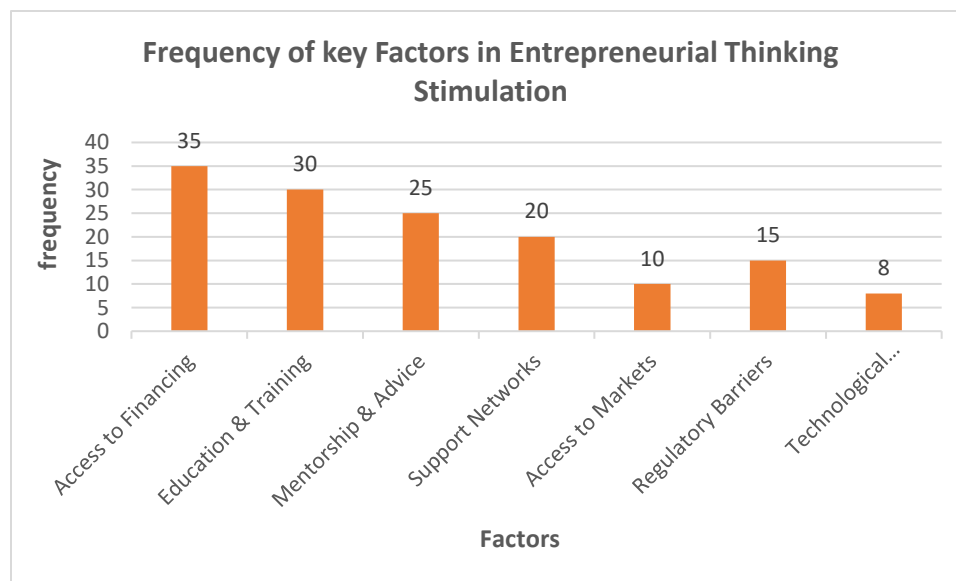


Figure 4: Frequency of key factors in entrepreneurial thinking stimulation

The histogram below illustrates the comparison of the priority levels among the frequently mentioned factors by the questionnaire participants. The higher values indicate the more significant factors in stimulating entrepreneurial thinking among the SMEs entrepreneurs in Kenya. In this case, “Access to financing” is the most important challenge with a priority level of 3 followed by “Education and Training” and “Mentorship & advice”.

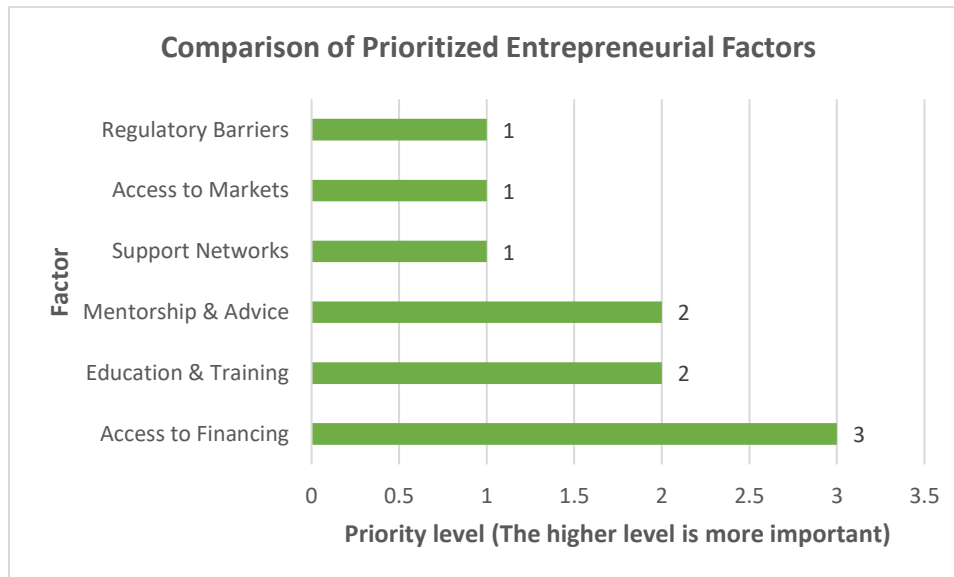


Figure 5: Comparison of prioritized entrepreneurial factors

The pie chart below illustrates the distribution of responses by factors in the analyzed questionnaires. It shows the proportion of each factor that stimulate entrepreneurial thinking, “Access to Financing, “Education and Training and “Mentorship and Advice” taking the large portions, highlighting their significance in the entrepreneurial thinking stimulation in holistic agri-food sector.

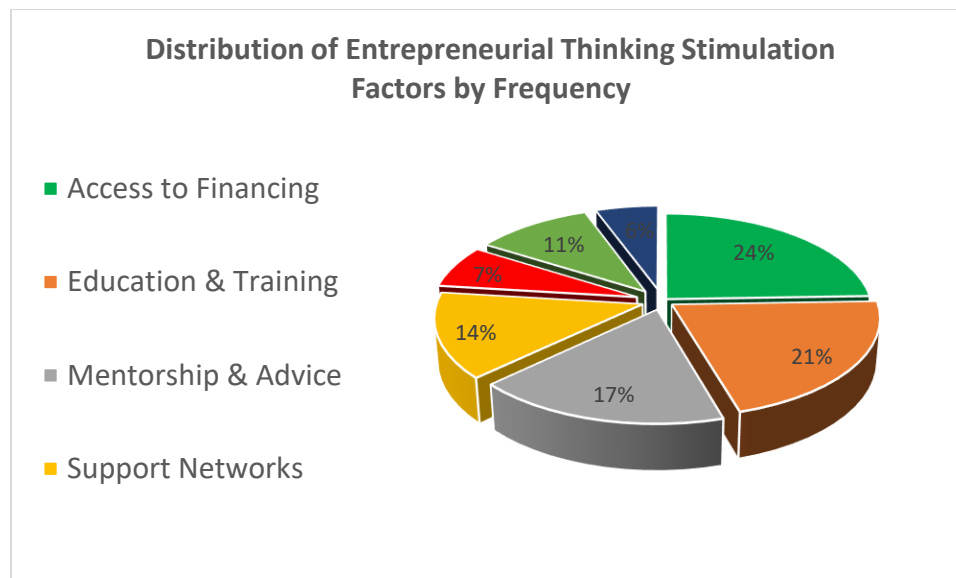


Figure 6: Distribution of entrepreneurial thinking stimulation factors by frequency

The diagram below explains the strong connections among the frequently mentioned nodes by the respondents. These are factors mentioned frequently together hence showing strong connection among them. The arrows indicate the connection between the concerned nodes e.g., Access to finance and Education & Training frequently appeared together in the questionnaire responses while Access to Mentorship also occurred together with support networks as well as access to financing.

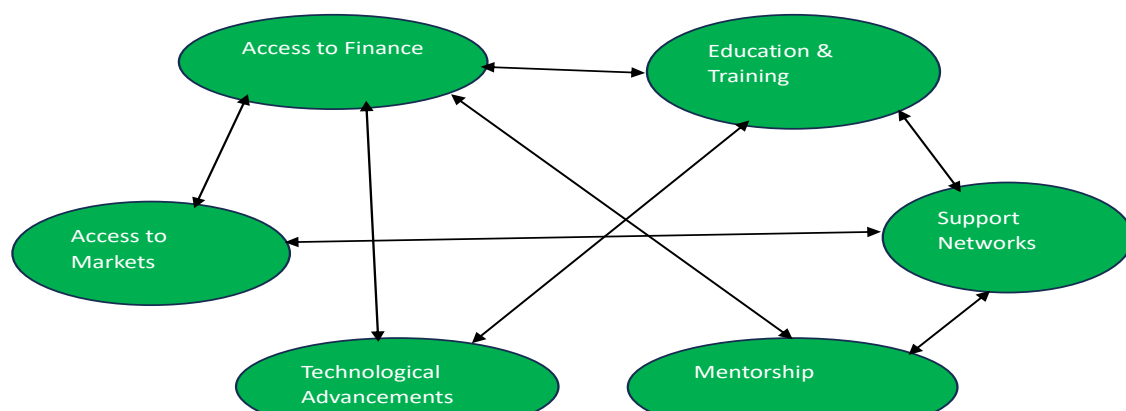


Figure 7: Networks in the Holistic Agri-Food Entrepreneurial Ecosystem

The participants of the Focus groups identified the crucial role of education in enhancing sustainable agricultural practices among SME entrepreneurs. They emphasized the need for a revised education curriculum that integrates essential elements of entrepreneurial thinking and digital literacy among agriculture students. There was a strong intervention on the importance of practical, hand-on trainings, facilitated through various agriculture workshops and agriculture hubs/ learning labs. For further sustainability promotion among SME entrepreneurs, the focus groups recommended enhanced capacity building programs that train farmers on financial literacy, marketing and business planning aspects. They also advocated for academic-industry link both nationally and international where students can get practical exposure through internships. As a result, the next generation of entrepreneurs will be well equipped with skills necessary to drive sustainable agricultural practices.

Constraints hindering Entrepreneurial Thinking Stimulation among SMEs Entrepreneurs in Kenya

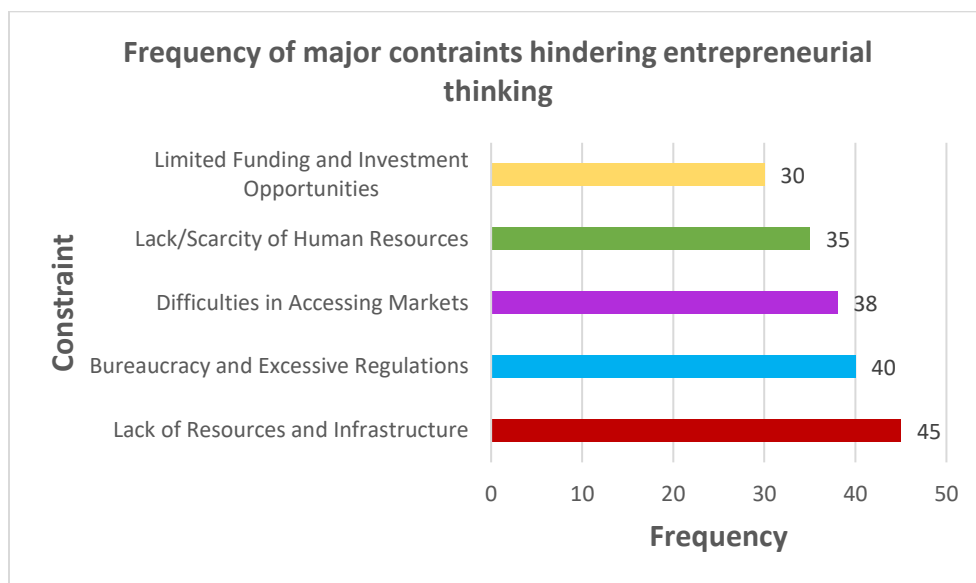


Figure 8: Frequency of major constraints hindering entrepreneurial thinking

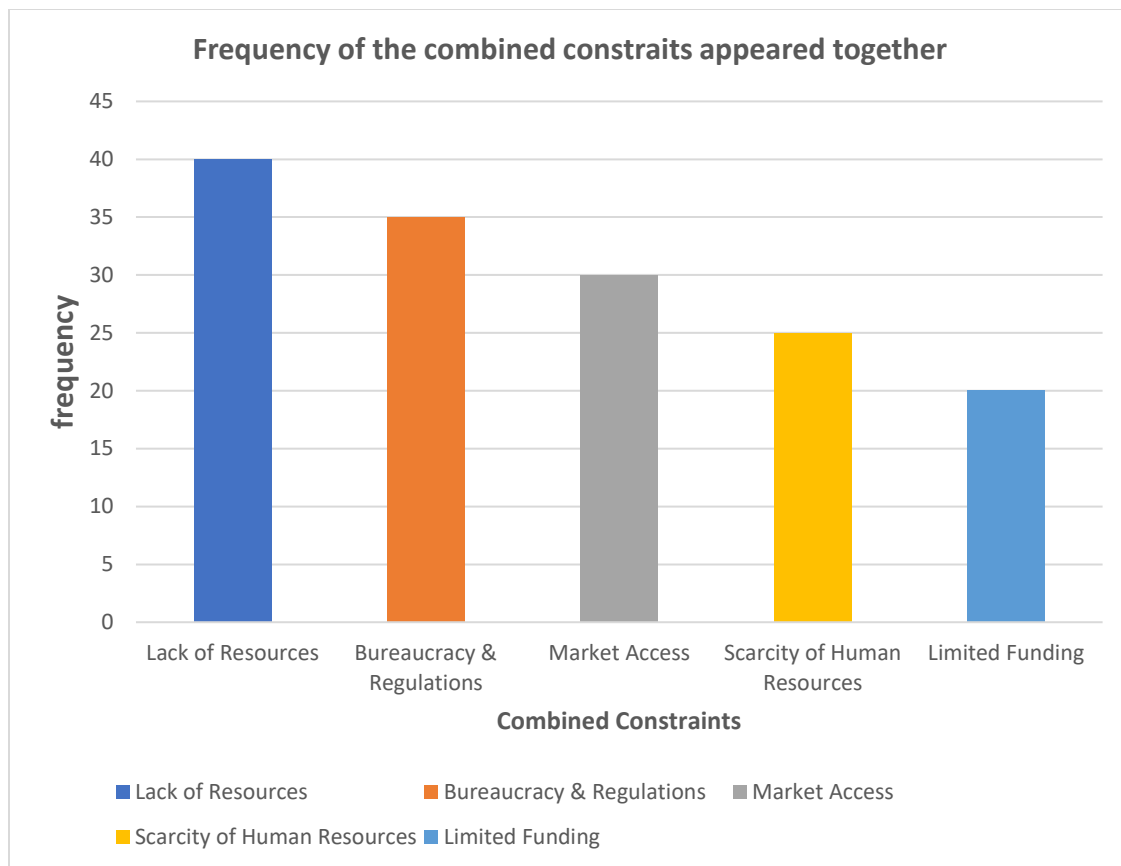


Figure 9: Frequency of combined constraints appeared together

The illustrations above indicate major constraints encountered while developing entrepreneurial thinking in holistic agri-food system. According to the study, Lack of access to adequate resources is a more recurrent theme among the respondents. Access to relevant modern technologies, agri-food facilities and financial support, necessary for innovation development, is a challenge to SMEs entrepreneurs as mentioned by many respondents.

Bureaucracy and regulations appear to be burdensome to SMEs entrepreneurs as spotted out by many respondents. Excessive bureaucracy and slow regulatory processes in agri-food sector hinder the particular innovation as well as entrepreneurial efforts to promote sustainability.

SMEs face difficulties in accessing to markets for their innovative products. This demotivates them and hinders the scaling up of their ventures. The respondents also mentioned the scarcity of human resources as one of the major challenges. There are few skilled labor force and expertise in holistic and sustainable practices hence hindering entrepreneurship and innovation.

Limited funding and investment opportunities make it hard for entrepreneurship and innovation among the SMEs entrepreneurs. This is due to insufficient funding for research activities, business development and growth, hence difficult to scale up entrepreneurs' efforts.

4.2. Innovation as a catalyst for sustainable practices

Technological advancements

Sustainable agricultural practices are driven by digital agriculture, value addition and problem-solving techniques. Innovation drives entrepreneurial thinking by promoting new ideas and agri-food solutions that enhance sustainability. Some entrepreneurs have adopted modern technologies such as beekeeping hives, irrigation systems and post-harvest management methods hence enhancing productivity and sustainability. These technological advancements inspire them to think critically about their business with continued innovation and new technologies adoption hence creating more sustainable and economic viable businesses in the long run. *“Conservation farming. My area of specialization is horticulture. Integrating local leafy vegetables, legumes – beans, greengrams, with perennial crops – napier grass, fruit trees, and agro-forestry built resilience to the farming communities. Appropriate farming techniques such as good agronomic practices, including planting early, planting improved seed varieties, climate-resistant varieties, use of manure promoted climate-smart agriculture.”*

“Reduced rainfall and high temperatures led to reduced amounts of water moisture. To deal with that, irrigation was put in place but the frequency of irrigation was also high.”

“Have tried to use the modern bee hive such as Longstroth rather than the traditional hives like log hives to improve my productivity.”

“I have the knowledge regarding the agri-food sector on how it works from production to consumption, because of my bachelor's degree in food security. I have been involved in most practicals that are related to the agri-food sector such as farming in the university farms. I have the experience of running a business that relates to the agri-food sector (mulberry beverage production).”

“The best we achieved so far as Lakeside Farms we introduced raised fish ponds and integrated our system to accommodate both aquaculture and horticulture. This has increased our yield and reduced our expenses by reducing fuel cost for irrigation purposes, fertilizer application, and reducing use of inorganic fertilizer.” “2023 was a fairly good year. Was able to acquire good water for irrigation (borehole water with very little salt).”

Technological advancements such as improved farming methods and post-harvest processing are recognized as important to overcoming challenges such as climate change and population growth due to increased food production (food security among households).

Value Addition

Adding value to agricultural products, such as transforming waste into valuable commodities (e.g., beeswax, mango peels, insect-based foods), is identified as a key opportunity for innovation. Such practices contribute to reducing waste, improving profitability, and promoting sustainable entrepreneurship. Selling of value-added products by processing them into more marketable products instead of raw products as well as developing new products, has also been emphasized on by students, professors and entrepreneurs (e.g. packaging and branding of honey). Some of the students mentioned the following as some of the opportunities that can be ventured in.

“Value chain addition of agricultural products deemed as not worth investing in for instance Beeswax and Mango peel wastes. These two are regarded as waste products after the useful part has been obtained. I believe, given a chance to do more research on it, a golden opportunity might present itself in this sector.”

“Growing demand for organic and other specialty food products is an opportunity for agribusiness. Value addition for agricultural products can increase the gross margin, thus an opportunity in the marketing and processing segment of the value chain.”

Innovation is seen as a critical driver of sustainable agricultural practices but access to new technologies remains a significant challenge. Entrepreneurs and students highlighted the

dynamic nature of agricultural technology, which requires constant adaptation and upskilling.

“The dynamic nature of ever-changing agricultural technology such as methods of production.”

The study identified value addition as a promising segment of the value chain, in areas like food processing and organic production although many businesses struggle to adopt advanced technologies due to high costs or lack of infrastructure. This has led to low levels of adoption of advanced technologies for improving value chain segments among SME entrepreneurs.” *Since it was an innovation in the market, getting fabricated machines to extract fibres from bananas was a challenge hence few who offered them were very costly.”*

“The greatest weakness is the financial constraints. To be self-employed, there are key equipment that one has to possess and they are costly.”

Barriers to Innovation

Limited access to modern technologies and high costs remains significant challenges for SMEs in Kenya across the Food Value Chain. Many entrepreneurs struggle to adopt modern machinery and technologies due to inadequate technical skills and financial constraints, suggesting a need for more accessible training programs and affordable solutions. The unfair prices for organic products demotivate greatly SME entrepreneurs for continuing with holistic agricultural practices. There is no awareness among many SME entrepreneurs about the available improved technologies across the regions. Minimal awareness on the products among some consumers which affect their perception towards the new innovative processes produced products. e.g., mistaking farmed fish as genetically altered fish.

” Culturally, our business is located amongst the community that are traditionally fish mongers hence marketing the aquaculture product has not been a big challenge. However, the perception of farmed fish is still a problem as most people think that they have been genetically altered and thus have toxic substances.”

“The support system for small-scale farmers who are the majority is still very low. Holistic Agriculture requires adequate training/capacity building on what constitutes holistic farming, and the means to achieve it. Funding availability for low-income and small-scale farmers is limited posing challenges to the adoption of holistic farming, and constitutes one of the priority

areas for intervention in promoting holistic agriculture. The remuneration/compensation mechanism for holistic farming is not well developed/or weak. This demotivates holistic farming for those willing to practice it. Better compensation in terms of better prices for agricultural produce, produced through this approach should be developed to encourage its practice. Otherwise, most farmers may not see profitability in practicing holistic agriculture compared to their normal practice. The agri-food sector is also confronted with new and emerging challenges like climate change, new strains of pests and diseases, and decreased soil fertility that demand quick fixes for better agricultural productivity. Some interventions to these challenges like heavy use of agro-chemicals undermine sustainable farming. Adoption of holistic farming is a long-term process that requires awareness creation, a strong support system for farmers, and leadership provided by both public and private sectors. These are lacking in the current agri-food sector in Kenya.” This response was highlighted by one of the interviewed professors. “Inadequate technology necessary to boost production” Identified as one of the threats to the implementation of the holistic agriculture.

During Focus group discussions, innovation, in both technology and processes, was mentioned as a major catalyst for sustainable agricultural practices among SME entrepreneurs. The presence of modern agricultural technologies like solar- powered farming, mechanization and hydroponics were seen as essential for improving productivity as well as minimizing environmental impact. Furthermore, the participants went ahead in discussing the benefit of farmer-led innovations and the need for platforms to promote these innovations through award-winning challenges and incubators.

The discussions also highlighted the capacity-building programs which should focus on empowering farmers to adopt modern technologies such as e-extension apps and solar power solutions, while supporting the start-up businesses and ideas at the grassroot level. To add on, the participants also stressed on the need for financial support specifically channeled to innovations in agriculture and called for co-financing models among SME entrepreneurs for easy affordability and accessibility of technological advancements to smallholder farmers.

4.3. Economic feasibility of sustainable practices

Financial Management and Market understanding

Economic feasibility is one of the important aspects playing pivotal role as far as agri-food system sustainability is concerned. It requires business skills, proper financial management and marketing knowledge from the individual entrepreneurs. This was mentioned several times in all categories during the interviews and Focus group discussions. For SME entrepreneurs to maintain sustainable operations, it's very crucial for economic challenges such as high input costs, market fluctuations and access to credit, be addressed. *“Inflation has made life very difficult. The cost of farm inputs has gone up; transportation costs due to high fuel costs have increased the cost of production. There has also been reduced sales due to consumers facing hard economic times.”*

Opportunities for growth

Increasing consumer demand for organic products as well as value added commodities, offers significant business opportunities for SME entrepreneurs in Kenya. The presence of grants and programs supporting youth and small/emerging businesses create a favorable and conducive environment for startups, while government subsidies can alleviate financial barriers.

“The Kenyan agri-food sector is dominated by small-scale farmers holding the potential for increased food security with empowerment and support. Besides, farming is highly diverse with great potential for better resilience. Kenya has also huge domestic and international markets for agricultural commodities. This huge market is good for profitable farming and can be leveraged to boost the country's economic growth attributable to agriculture. For instance, the country has huge markets for fruits like avocado in Middle Eastern countries. Holistic agriculture would be important to produce agricultural commodities/produce that meets international standards to broaden and sustain the nation's market for profitable farming. The country is endowed with large arable land, and good climate that can support holistic agriculture for increased agricultural productivity. Further, with proper irrigation regimes, the large arid/semi-arid land with better natural soil fertility can be utilized to boost agricultural production and help reduce soil fertility improvement with inorganic fertilizers.”

“The current heightened call on sustainability transition: sustainable farming, sustainable development, and climate-smart agriculture initiatives. Increasing market demand for organic foods. Increasing cost of farming attributed to synthetic chemicals. Public-private partnership in agricultural sector development, providing interventions like extension, and farmers’ training on sustainable farming, and inputs supply.”

“There are changes in perception in well-being. People don’t want to consume crops produced using fertilizers. Some are specific that they want to consume crops produced using organic manure. Others are specific on varieties.”

“Being a new idea to the locals, training of the target group mostly youth and women was key to improving the competence levels and to transform the mindset into business-oriented and employment. It was also important to align the farmers' expectations regarding the technology being introduced.”

Economic challenges

Sustainability is often limited by various economic factors such as inflation, poor/inadequate infrastructure and high input costs. During the study, many businesses reported financial constraints including lack of access to capital crucial for the operation of the business, high taxation especially from the government and price instability in the markets. These challenges are further compounded by competition from imported goods e.g imported tilapia fish from China, making it difficult for local businesses to remain profitable. Despite the growing market demand for organic and healthier products among the consumers in the country, entrepreneurs face prolonged unpaid debts and liquidity issues which hinder expansion. Furthermore, the rural-urban migration issue and fluctuating population growth, were clearly brought up by the majority of the interviewees as they significantly impact the demand for agricultural products.

“Weak partnerships among stakeholders (PPP). Unfavorable policy environment. High taxation rates at every node/segment value chains. Undeveloped infrastructure. Low level advanced technology for improving the value chain segments. Little incentives for producers, SMEs, and other chain actors. Inadequate innovative knowledge/skills. Low capital (particularly financial) base for startups. Ineffective institutional/organizational structures.” This is one of many

responses from the interviewees identified as weaknesses of the national agri-food sector hindering the holistic agriculture adoption process in the country.

“Lack of enough working capital hampered operations. High prices of inputs made production difficult and losses were incurred due to unavailability of inputs as a result of the high costs.”

“Yes, our business is affected by the declining birthrate. Low population has led to low consumption of some of our products like milk, especially when there is a market glut. Changing concepts of family have really affected our business. Migration of people from rural to urban areas has reduced our customers for milk and meat.”

“Yes, there have been changes in local, regional, and national culture. For example, the introduction of levies to agricultural produce has led to an increased burden on farmers.”

During Focus group discussions, the participants emphasized the importance of making farming techniques more cost effective hence easily affordable by SME entrepreneurs. Strategies such as solar powered, irrigation systems and optimal land use were seen as essential elements in improving SME entrepreneurs’ profitability. Additionally, financial institutions were encouraged to offer farmer-friendly financial packages, due to the risk nature of farming hence enabling small and medium scale farmers to scale to sustainable practices.

4.4. Holistic Approach to Agriculture

Integrated farming and resource management

The holistic approach entails integrating of economic, social and environmental aspects of sustainability. Climate-smart farming, organic farming, conservative agriculture and agroforestry are essential for long-term sustainability. It links agriculture with human nutrition, sustainable natural resource management and adaptability to climate change which is a major global issue at the moment. The study found out that businesses in Kenya have started putting up some strategies to adopt to climate risks through implementation of climate smart agriculture practices like organic farming, conservation techniques and agroforestry which is highly supported by the current government.

The government of Kenya has recently declared a tree planting day as a public holiday for tree planting countrywide to promote agroforestry following last year's prolonged drought. Some of the adopted sustainable techniques among SME entrepreneurs mentioned during focus group discussions, especially at SEKU, were zero tillage, water harvesting and soil conservation techniques. Focus group participants also emphasized the importance of biodiversity and conservation in maintaining soil health and increasing resilience to climate change due to the dryness nature of the region (Makueni).

“To mitigate the climate change, there was planting of trees.” “There was a prolonged drought that made the availability of flora and water scarce, thus low honey production. To mitigate these; water was provided near the bee hives for the bees and future plans of planting drought-resistant flower trees started.”

“Government subsidies, for example, subsidized fertilizers, purchase of maize produce encouraged farmers to grow more food crops. Planting trees to modulate climatic threats and expansion of irrigation use. The government is also encouraging digital agriculture for youth inclusion in agriculture.”

Health and nutrition awareness

Consumer preferences have also emerged with great consideration of healthy food free from inorganic chemicals and rise demand for vegetables, fruits honey and moringa. Therefore, entrepreneurs are increasingly aware of healthy and sustainable production. The growing trend towards fruits, vegetable and honey production, emphasizes the need for more nutrition education and awareness programs. *“Good policies for agribusiness, establishment of food and nutrition education centers, and intercultural education centers.”* This is highlighted as one of the opportunities for entrepreneurship. *“I have very little knowledge in food processing industries. I don't have much knowledge about food nutrition. What can help me to get rid of this weakness is by learning more about food security and also to have more knowledge about food industries that are related to agriculture.”* This is one of the responses from one of the Kenyan students highlighting the need for nutrition education programs for more knowledge.

Challenges faced

Adapting to climate change among SMEs, resource scarcity and resistance to non-traditional products by consumers pose significant challenges in adopting holistic agriculture practices as it limits wider acceptance of modern farming techniques. Furthermore, businesses need to plan for long-term shifts in demographic and market trends to ensure sustained success as far as labor supply and ready market are concerned. This will allow flexibility during labor shortages and low consumption due to reduced population as a result of decline in birthrate.

4.5. Economic collaboration and peer learning

Collaborative marketing

Entrepreneurs benefit from collective marketing of their produce and peer learning from each other. This enables them address competitive pressures and share best innovative practices collectively. They also highlighted benefits from partnerships with NGOs, stakeholders, educational institutions and government agencies which play vital role in building a sustainable agri-food system. A few mentioned institutions are the; LAKEHUB, GIZ, KEBS, County governments, hospitals, schools and many more.

The focus group participants also highlighted the importance of community involvement and collaboration between stakeholders including the researchers, students and entrepreneurs. This facilitates the sharing of resource and the researched knowledge from the research institutions to intended SME entrepreneurs. This collaborative approach could empower farmers to adopt resilient farming techniques and better withstand climate and market shocks. ” *No, there have not been any significant changes in cultural aspects – except perhaps the change in cultivation/tilling land by tractors as compared to yesteryears when tilling was done by hand.* ”

Knowledge sharing and networking

The establishment of networks, mentorship programs and apprenticeship centers facilitate knowledge exchange, skills development and market access hence contributing to the growth and sustainability of SME entrepreneurs in agriculture. The focus groups also discussed the

importance of support from financial institutions, suggesting that banks and investors sponsor innovation projects that promote sustainable agricultural practices across the country. Cross-sectoral partnerships, particularly between researchers, entrepreneurs, and policymakers, were seen as critical in creating an enabling environment for innovation and knowledge-sharing.

“We believe in creating and growing our networks. We have worked together with HSWT through Farming Systems Kenya (a not-for-profit organization based in Nakuru) to oversee administrative and fund-management roles. The relationship was fluid and we look forward to working again. We have also worked closely with the County Government of Kisumu Livestock Department through a representative. We look forward to engaging competent authorities such as KEBS and Kenya Dairy Board.”

“Makueni Fruit Processing Plant (MFPP) collaborates with government institutions such as the Kenya Revenue Authority (KRA), Kenya Bureau of Standards (KEBS), and the Horticultural Crops Directorate (HCD). All these institutions support the plant on compliance matters on tax payment and product quality respectively.”

“I collaborate closely with agricultural training institutions around, offering attachment and internship in our demo farm. Students also provide additional skills and labor.” “Yes. Collaborate with CRS, ONE ACRE FUND, German Agro - for capacity building and empowering women through Savings and Credits.” “There is a strong relationship between our farm and state institutions and non-governmental institutions. Our farm accepts field visits from government institutions like schools, universities, and NGOs for training purposes.”

“There have been changes in the culture. People keep on coming to benchmark to borrow best practices. Earlier, benchmarking was not common.”

However, there are some barriers to successful collaborations and partnerships. The study found out that lack of access to fruitful partnerships, mentorship and professional networks always limit entrepreneurs' ability to collaborate and learn from others. Addressing these challenges is important for fostering a culture of shared knowledge and economic collaboration hence assisting the businesses in leveraging shared scarce resources available, improve production quality and enter new markets. The need for collaboration in addressing economic and

sustainability challenges among SMEs was a recurring theme during interviews as well as in Focus group discussions.

Extent to which education and training in innovation is important for students and entrepreneurs in the holistic agri-food sector.

(1 - not important at all, 2 - unimportant, 3 - neutral, 4 - important, 5 - very important)

SCALE	ENTREPRENEURS	PROFESSORS	STUDENTS
(Negative) 1	0	1	0
(Negative) 2	1	0	1
(Neutral) 3	3	1	3
(Positive) 4	27	11	17
(Positive) 5	78	34	95

Table 9: Extent to which education and training in innovation is useful to students and entrepreneurs in holistic agri-food sector

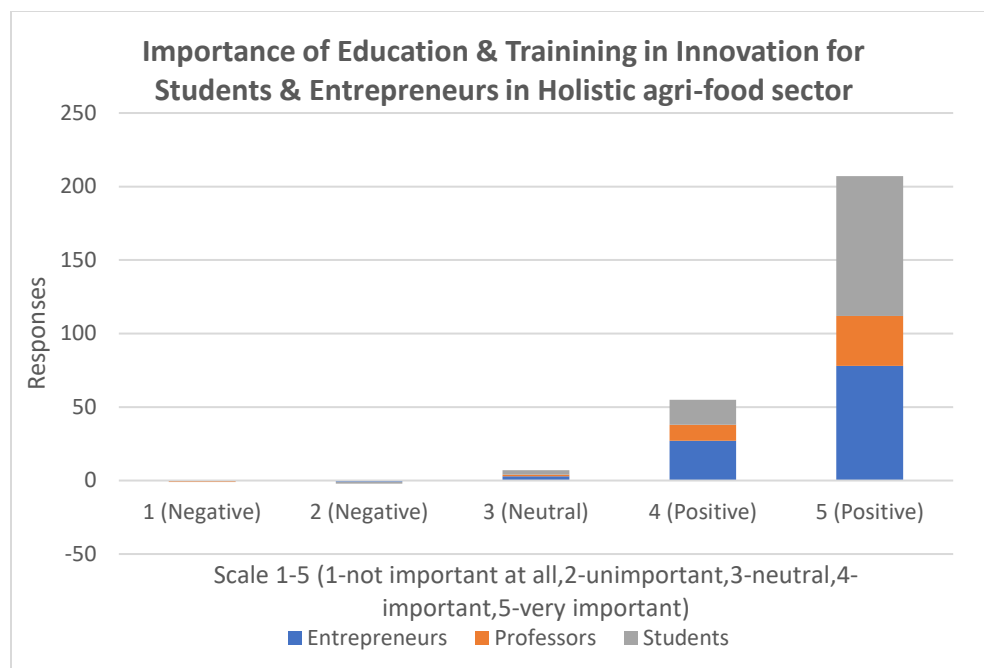


Figure 10: Importance of education and training in innovation for students and entrepreneurs in holistic agri-food sector

The above results emphasize on education and innovation across different groups as crucial tools in developing a sustainable agri-food system among SMEs entrepreneurs. The majority of entrepreneurs (78) rated education and training in innovation as very important (scale,5) for them and the students in holistic agri-food field, 27 rated as important (scale,4) while 3 remained neutral (scale,3) and none saw it as unimportant (scale,2). The professors' highest group (34) rated education and training in innovation as very important (scale, 5) for students and entrepreneurs for holistic agriculture, 11 rated as an important (scale,4) aspect for students and entrepreneurs while 1 remained neutral (3) and 1 saw it as not important at all (scale, 1). 95 students rated education and training as very important (scale,5) for them and the entrepreneurs in holistic agri-food sector, 17 rated as important (scale,4) while 1 saw as unimportant (scale,2).

Both students and entrepreneurs recognize innovative thinking and continuous learning of new ideas as a solution to sustainable challenges especially with the current global climate change issue. Entrepreneurs as well view education and training as important way to learn innovative and entrepreneurial skills which offer them competitive edge in this changing and dynamic market. Therefore, the entrepreneurs, emphasize on the need for education and training to enable

their entrepreneurial ventures adapt to environmental changes, changing consumer demand and sustainable practices. The professors who are also the researchers, emphasize on the need for integrating innovation in the school curriculum for future advancements along the sustainable food value chain. The students, who are the future entrepreneurs, also consider education and training in innovation as vital program to equip them with necessary skills and innovative thinking required in the industry.

5.0. SWOT ANALYSIS (FROM FOCUS GROUP RESULTS)

This SWOT matrix elaborates the feedback and suggestions from the Focus Group discussions conducted in both SEKU and JOOUST. It illustrates a comprehensive picture of internal and external potentials as well as external and internal challenges faced by SMEs entrepreneurs in Kenya's agricultural sector. The potential/strengths identified provide a foundation onto which a sustainable agri-food system can be built. However, the existing weaknesses such as limited access to necessary resources and entrepreneurs' perception towards new technologies and new agricultural products in the market respectively, need to be addressed in order to remove barriers to innovation.

The highlighted opportunities provide a platform for SMEs entrepreneurs to transform and scale up their businesses into more sustainable and profitable agriculture ventures. The identified threats such as environmental changes and market gaps, call for strategic interventions to ensure sustainability and viability of local agricultural ventures across the country. Therefore, leveraging the strength and opportunities available while addressing weaknesses and providing mitigation measures against threats can enhance the development of a sustainable agri-food system in Kenya.

STRENGTH • Education and Training programs • Collaborative initiatives	WEAKNESSES • Limited access to necessary resources • Entrepreneurs' perception
OPPORTUNITIES • Support and Grants from the government • Innovation hub centres and Economic partnerships	THREATS • Environmental changes • Market gaps

Figure 11: SWOT Matrix for Developing a Sustainable Agri-Food system

Strength

Collaborative initiatives: During the discussions, Group three members highlighted the significance of “*Cooperation among stakeholders*” and “*Starting of agricultural hubs*”, an indication for a strong foundation for collaboration among students, researchers and entrepreneurs that can foster innovation and entrepreneurial thinking in agriculture. There were also mentions on university-based programs and industry partnerships aimed at technological advancements in farming. The innovation hubs can be used as incubators for new innovative ideas and enhance partnerships among the particular stakeholders (researchers, students and entrepreneurs). This is an internal strength for SMEs entrepreneurs in Kenya which can be exploited for the development of a sustainable agri-food system for holistic agriculture.

Education and Training Programs: Various stakeholders stressed the need for “*Capacity building*” and “*training on digital literacy*” among the SMEs entrepreneurs for relevant knowledge and skills acquisition, vital for the enhancement of the adoption of sustainable agricultural practices across the country.

Weaknesses

Limited Access to necessary Resources: “*Financial literacy training*” and “*Access to credit facilities*” were recurrent themes among the participants. This clearly suggests that SMEs entrepreneurs are faced with significant financial challenges which limit their ability to innovate as well as business scaling up, due to insufficient financial support from both private and public sector. This internal challenge hinders the development of a sustainable agri-food system as far as the holistic agriculture is concerned.

Cultural Perceptions: Group 2 members spotted the “*Change in mind set/perception*” of SMEs entrepreneurs who view agriculture as a merely means for survival instead of a business. This is an indication of a prevalent attitude that may impede the entrepreneurial spirit significant for innovation within the agri-food sector.

Opportunities

Government Support and Grants: Several responses from the Focus Group discussions, indicate strong potential or government involvement in agriculture through provision of “*policy environment / regulatory framework*” and “*finance / grants for innovation*”. The highlighted opportunities can improve SMEs entrepreneurs’ investment in new technologies by providing conducive environment and relevant resources for innovation i.e. sufficient capital and favorable taxes.

Innovation Hubs and Partnerships: “*Incubation hubs*” and “*funded innovation challenges*” proposals from the participants, imply a ready environment for fostering innovation through structured systems in the country that could help in the transformation of agri-food systems to more sustainable systems.

Threats

Environmental changes: The need for affordable “*mechanization*” and “*Embracing new farming technologies*” pointed by several responses, imply that the changing climatic conditions and its negative impacts pose threats on the existing unimproved farming methods. These negative impacts threaten the continued adoption of sustainable practices among SMEs entrepreneurs. Therefore, integrating mechanization and new technologies is a key solution to the changing climatic conditions and its impacts for a sustainable agri-food sector.

Market gaps: The need for “*markets for the produce through the cooperatives*”, “*Create market linkages, formation of farmers’ cooperative societies to have bargaining power and minimize post-harvest losses*” and “*Digital online marketing as opposed to physical/verbal marketing*”, suggests that there are market gaps along the chain which need to be addressed. These gaps threaten the development and existence of a sustainable agri-food marketing system along the food value chain.

6. 0. CONCLUSION

6.1. Key Findings and Implications for a sustainable Agri-food System in Kenya

Education and innovation as major tools

Education and Innovation are the fundamental drivers of sustainability in the agri-food system among the SMEs entrepreneurs in Kenya. They stimulate entrepreneurial thinking and encourage new ideas among SMEs entrepreneurs hence promoting holistic agriculture practices. Through incorporation of mentorship programs, relevant practical training and skill development programs, and exposure to modern agricultural practices, SME entrepreneurs can develop the necessary entrepreneurial skills to adapt to the dynamic agricultural landscape. There is a need of creation awareness among consumers on the modern innovation technological processes through which the products undergo to avoid bad perceptions and wrong choices.

The education curriculum system in Kenya is a key foundation to agriculture education provision among entrepreneurs. However, there are gaps in this curriculum which need to be filled for proper alignment with the industry needs. Many entrepreneurs lack necessary financial literacy and technical expertise crucial for the management of sustainable agriculture practices effectively. This has led to increased unemployment rate among youth due to incompetency and less practical experience despite being educated.

The findings imply the need for education policy reforms in such a way that the education system focuses mainly on modern technology, entrepreneurship and sustainability as the core aspects in agricultural training programs. These education interventions will empower future resilient and competitive leaders in agriculture sector.

Technological advancements has been a recurred theme among the participants. According to the study, the adoption of the available modern technology in the country among the SME entrepreneurs such as modern beekeeping methods and improved irrigation systems, has shown positive returns on the productivity. Despite this fact, the access to these technologies has remained a challenging issue among the small and medium-sized entrepreneurs due to financial constraints, lack of available modern technology awareness and insufficient relevant technical skills.

Value addition is a food value chain segment that is underutilized in Kenya according to the study. Venturing in transforming by-products and wastes like beeswax and mango peels, as highlighted in the research, into marketable products, the small and medium-scale entrepreneurs can improve their profitability while enhancing sustainability. Although, this is only possible with enough capital and required technology, which is hardly accessible by Small and Medium-scale entrepreneurs in the country.

Economic feasibility of sustainable practices

Financial constraint is one of the major challenges and barriers to sustainability among small and medium scale entrepreneurs. Many SMEs have a dream of venturing in agriculture innovations and expanding their business but this is shuttered by limited access to sufficient capital due to high costs associated with credits and the expensive nature of the modern technologies.

Regardless of the financial limitations, there are opportunities for growth due to the increasing consumer demand in the market for organic and value-added food products. Government and private sector can chip in by providing SMEs entrepreneurs with grants and subsidies to lift the financial pressure hence encouraging the entrepreneurs to venture in sustainable practices.

There's also a need for strong infrastructure development and facilitation of the collaboration between the SMEs entrepreneurs and the financial institutions to enhance the availability of necessary resources to gear up the sustainable processes.

Promoting a Holistic Approach

Sustainable agriculture requires the integration of environmental, social and economic aspects (Integrated Farming Practices). SME entrepreneurs can contribute to a holistic agriculture model by adopting to climate-smart agriculture practices, scarce resource management techniques and promoting healthy and nutritious food production in the long run.

Government support has been recognized in the study by initiating the tree planting programs to combat climate change. This was a positive move towards ensuring food security in the country especially with last year's prolonged drought as expressed by the participants. However, more governmental support is required in the enhancement of agricultural trainings among SME entrepreneurs as well as financial subsidies for sustainable agriculture. This will promote increased long term sustainable practices across the country for holistic agriculture.

Consumer preferences and health awareness is another theme emerged in this research study. Many consumers prefer organic and healthier food products to inorganic agriculture food products in the market. According to the study, this demand has been increasing an indication of a significant driver for sustainable agriculture. This shift in consumer preferences call for increased public education and awareness on the advantages of sustainable agri-food systems in the country. This will also help build good perception towards the existing and future different innovation technologies in the country.

Fostering collaboration and Peer Learning

Building strong networks, partnerships and mentorship programs can enhance knowledge sharing, skill development, and ready market access among SMEs entrepreneurs. Collaboration among stakeholders, including educational institutions, NGOs and government agencies, is essential for developing a sustainable agri-food system.

These collaborations between the research institutes and the entrepreneurs have shown positive impact on pool resource sharing and knowledge transfer on various sustainable agricultural practices. The development of innovation incubators, practical training and mentorship programs were emphasized by focus group participants as tools to facilitate sustainable agriculture among the SMEs entrepreneurs.

In spite of these benefits, some SMEs entrepreneurs are faced with challenges in participating in professional collaborations, mentorship programs and economic networks. Building different platforms that promote cross-sector partnerships and mentorship programs would facilitate knowledge sharing as well as resource sharing among the SMEs entrepreneurs.

Addressing Economic Barriers

According to the research, these are the main challenges faced by SME entrepreneurs in Kenya in technology adoption and maintaining sustainability in their operations along the Food Value Chain. These includes limited access to capital, limited access to modern technologies, high input costs and market volatility due to inflation. The need to address these challenges is to ensure sustainability of SME entrepreneurs through provision of financial literacy trainings, fully government support of SMEs entrepreneurs (e.g., subsidizing inputs, funding and trainings, protecting local production) and easy access to affordable modern technologies.

In conclusion, interviews, questionnaires and Focus group discussions revealed that the development of a sustainable agri-food system can be achieved successfully among SME entrepreneurs in Kenya through a multi-faceted approach which integrates education, innovation, economic collaboration and holistic approach in agriculture.

By addressing key barriers such as financial constraints, technological adoption and practical knowledge/training gaps while leveraging entrepreneurship opportunities in value addition, market growth and expansion, as well as promoting cross-sector collaboration networks, a conducive environment for SME entrepreneurs will be created hence overcoming challenges and developing a sustainable model that will benefit the environment, food security status in the country and the Kenya's economy.

7.0. BIBLIOGRAPHY

Kenya Bankers Association 2021- Micro, Small & Medium Enterprises Survey Report. Joint publication of the Kenya Bankers Association (KBA) Centre for Research on Financial Markets and Policy ® and Japan International Cooperation Agency (JICA).

Stephene. M. et al. (2022) - Understanding Startups Ecosystem in Kenya: Drivers, Challenges, and Opportunities; Article in Journal of Business and Management Sciences · July 2022 DOI: 10.12691/jbms-10-3-5. Available online at <http://pubs.sciepub.com/jbms/10/3/5> Published by Science and Education Publishing DOI:10.12691/jbms-10-3-5

Capra, F., & Luisi, P. L. (2014) - The Systems View of Life: A Unifying Vision. Cambridge University Press.

Francis, C. A., Geir, L., & Gliessman, R. (2003) - Journal of Sustainable Agriculture, 22(3), pp. 99-118.

Gliessman, S. R. (2015) - Agroecology: The Ecology of Sustainable Food Systems (3rd ed.), CRC Press.

Altieri, M. A. (1995) - Agroecology: The Science of Sustainable Agriculture (2nd ed.), CRC Press.

Rogers, E. M. (2003) - Diffusion of Innovations (5th ed.), Free Press.

Pannell, D. J., et al. (2006) - Understanding and Promoting Adoption of Conservation Practices by Rural Landholders, Australian Journal of Experimental Agriculture, 46(11), pp. 1407-1424.

Kapari, M., et al. (2023) - Article in Frontiers in Sustainable Food Systems, DOI: 10.3389/fsufs.2023.1149854.

Smyth, S. J., et al. (2021) - Global Food Security, 31, DOI: 100588.

ILO (2008) - Referenced for insights on market connectivity and agricultural challenges.

Brixiova, Z., et.al. (2020) - Access to finance among small and medium-sized enterprises and job creation in Africa).

FAO (2017) - The Future of Food and Agriculture, emphasizing food systems.

Alliance For African Partnership, Michigan State University (2022) - Youth Entrepreneurial Ecosystem for Sustainable Development in Sub-Saharan Africa. Available at: AAP Youth Report.

Yadegaridehkordi, E., Foroughi, B., Iranmanesh, M., Nilashi, M., & Ghobakhloo, M. (2023) - Determinants of environmental, financial, and social sustainable performance of manufacturing SMEs in Malaysia, *Sustainable Production and Consumption*, 35, pp. 129-140. DOI: 10.1016/j.spc.2022.10.026.

International Food Policy Research Institute (IFPRI) (2017) - RURAL YOUTH EMPLOYMENT, prepared for the World Bank and IFAD, on behalf of the German Federal Ministry for Economic Cooperation and Development.

Christiaensen, L., Rutledge, Z., & Taylor, J. E. (2021) - The future of work in agri-food, *Food Policy*, 99, Article 101963. DOI: 10.1016/j.foodpol.2020.101963.

Shoaib, M., Nawal, A., Zámečník, R., Korsakienė, R., & Ur Rehman, A. (2022) - Go green! Measuring the factors that influence sustainable performance, *Journal of Cleaner Production*, 366, Article 132959. DOI: 10.1016/j.jclepro.2022.132959.

Schubert, T., Kroll, H., & Garcia Chavez, C. (2023) - The effects of sustainability orientation on research and teaching efficiency in German universities, *Socio-Economic Planning Sciences*, 88, Article 101676. DOI: 10.1016/j.seps.2023.101676.

Tamayo-Orbegozo, U., Vicente-Molina, M-A., & Villarreal-Larrinaga, O. (2017) - Eco-innovation strategic model. A multiple-case study from a highly eco-innovative European region, *Journal of Cleaner Production*, 142(4), pp. 1347-1367. DOI: 10.1016/j.jclepro.2016.11.174.

Huan, Y., Zhang, R., & Kim, C. (2023) - Intelligent analysis system of college students' employment and entrepreneurship situation: Big data and artificial intelligence-driven approach, *Computers and Electrical Engineering*, 110, Article 108823. DOI: 10.1016/j.compeleceng.2023.108823.

Franceschet, S., Krook, M. L., & Piscopo, J. M. (2012) - *The Impact of Gender Quotas*. New York: Oxford Academic. DOI: 10.1093/acprof/9780199830091.003.0001, accessed May 3, 2024.

Krook, M. L. (2006) - Gender Quotas, Norms, and Politics. *Politics & Gender*, 2(1), pp. 110-118. DOI: 10.1017/S1743923X06231015.

UN Women (2022) - Progress on the Sustainable Development Goals: The gender snapshot 2022. Available at: [UN Women Digital Library](#).

United Nations - Goal 5 | Department of Economic and Social Affairs. Available at: [SDGs Goal 5](#)

8.0. APPENDIX

Appendix 1: Interview Guide

Subject name	Interview form number
Field of activity	Female ☐ Male ☐
Business size: small ☐ medium ☐ large ☐	

INTERVIEW GUIDE*

for entrepreneurs

Interviewer name	Date
---------------------------	------------

Thank you for taking the time to speak with us today.

Our name isand we are from(University of)

We are a team participating in the research on "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa", necessary for our university to know the problems of the agri-food field.

We assure you that this is not a control. We'll take notes just so we don't miss anything important from the discussion. These notes and the discussion we will have are confidential (they are only for us and will not be available to any administrative institution).

We will talk about aspects of your business and the area in which you operate.

Please feel free to express your opinions. We are here to listen to you.

Question 1 Introductory (5 minutes discussion to relax the atmosphere)

How was 2023? What was the best thing that happened in your business recently?

Synthetic notes

Question 2 Environment and climate change (*discussions** will be oriented towards the description of some situations and actions taken*)

What were the main environmental challenges? Did you notice any environmental changes and what did you need to do? What could help you in this regard?

Synthetic notes

Question 3 Demographic situation (*discussions will be oriented towards opinions and actions*)

Is your business affected by the declining birthrate? Are changing concepts of family affecting your business?

Can be discussed: migration, birth, marriage, etc.

Synthetic notes

Question 4 Economic climate (*discussions will be action oriented*)

What were the difficulties you encountered economically?

The following can be discussed: the evolution of prices, malfunctions in supply, the evolution of consumption, etc.

Synthetic notes

Question 5 Social climate (*discussions will be action oriented*)

What were the difficulties you encountered socially?

The following can be discussed: labor migration, unemployment in general and especially among young people, reducing / improving access to education, etc.

Synthetic notes

Question 6 Traditions and manners (*discussions will be action-oriented*)

Is your business based on certain traditions or consumption habits? Have you had to take certain actions to change your consumption pattern?

Can be discussed: current consumption patterns in correlation with traditional ones, difficulties in adapting production to changes in demand, competition of traditional products vs. imported products, etc.

Synthetic notes

Question 7 Psychosocial environment (*discussions will be opinion-oriented*)

Have you noticed changes in the perception of well-being among employees and customers? Did some situations catch your attention? What are the main generational differences in well-being?

The following can be discussed: customer attitude, opinions regarding the competence of young people at the time of employment, opinions regarding the expectations of young people at the time of employment, the general atmosphere of employees in the company, etc.

Synthetic notes

Question 8 Cultural impact (*discussions will focus on opinions and actions taken*)

Do you think there have been important changes in local, regional, national culture? Have you taken any steps to capitalize on or mitigate these changes?

The following can be discussed: the impact of education on the standard of living, the relevance of cultural events for the subjects' business, etc.

Synthetic notes

Question 9 Legislative context *(discussions will be action-oriented)*

Have you had great difficulty in changing some laws? What was the impact of the legislative changes on the business? Does the company, its own employees, partners help you in adapting your activity to the legislative requirements?

Can be discussed: general perception of the legislation, actions determined by legislative changes, etc.

Subjects will be assured that you are not seeking information about any violations of the law and that their responses may not affect them in any way.

Synthetic notes

Question 10 Political climate *(discussions will be oriented towards opinions)*

How would you describe the political climate in a few words? Is this predictable enough? Are there any significant impact changes?

The following can be discussed: political support for entrepreneurs, representation of producers through professional associations or product associations, communication with the ministry representing the branch, etc.

Subjects will be assured that discussions are not about their political choices.

Synthetic notes

--

Question 11 Institutional climate (*discussions will be action-oriented*)

How would you describe your company's relationship with state institutions in a few words? Are there non-governmental institutions that you collaborate with?

The following can be discussed: the efficiency of administrative institutions, situations created by certain practices of public institutions, actions taken to compensate or reduce the effect of some public services, etc.

<i>Synthetic notes</i>

Question 12 Competencies for employment in agribusiness (*opinion discussions*)

What do you think are the top 3 skills needed for college graduates looking to work at a company like yours?

(Arguments for these are awaited)

<i>Synthetic notes</i>

Question 13 Competencies for agribusiness entrepreneurship (*discussions about subjects' views on what an entrepreneur in this field needs to know, be able to do*)

What do you think are the top 3 skills that have helped you the most in your business?
(Arguments or examples are requested for these)

Synthetic notes

Thank you for helping us understand some things about your business. This information is valuable and will be useful in the development of this field of activity.

Debriefing-ul echipei de intervieatori după interviu

- a. Assessments regarding subjects' willingness to participate in discussions
- b. Assessments regarding the general ambience of the interview
- c. Assessments regarding mood (optimistic, pessimistic, balanced)
- d. Assessments of subjects' confidence in education and research
- e. Other appreciations depending on the overall impression

Question 2 Strong points favorable to the implementation of holistic agriculture (*discussions** will be opinion-oriented*)

What do you think are the strengths of the national agri-food sector that would favor the implementation of holistic agriculture?

Synthetic notes

Question 3 Weaknesses for the implementation of holistic agriculture (*discussion of subject views*)

What do you think are the weaknesses of the national agri-food sector that would hinder the implementation of holistic agriculture?

Synthetic notes

Question 4 Opportunities for the implementation of holistic agriculture (*discussions will be opinion-oriented*)

What do you think are the threats to the national agri-food sector? How do these threats hinder the implementation of holistic agriculture?

Synthetic notes

Question 5 Threats towards the implementation of holistic agriculture (*discussions will be opinion-oriented*)

What do you think are the opportunities that the national agri-food sector can benefit from? How can these opportunities be fruitful for the implementation of holistic agriculture?

Synthetic notes

Question 6 Competencies for employment in agribusiness (*opinion discussions*)

What do you think are the top 3 skills needed for college graduates who want to work for a company that implements holistic agriculture?

(*Arguments and examples for these are expected*)

Synthetic notes

Question 7 Competencies for agribusiness entrepreneurship (*discussions about subjects' views on what an entrepreneur in this field needs to know, be able to do*)

What do you think are the top 3 skills that an entrepreneur who wants to implement holistic agriculture must have?

(Arguments or examples are requested for these)

Synthetic notes

Thank you for helping us understand some things about your business. This information is valuable and will be useful in the development of this field of activity.

Debriefing-ul echipei de interviatori după interviu

- a. Assessments regarding subjects' willingness to participate in discussions
- b. Assessments regarding the general ambience of the interview
- c. Assessments regarding mood (optimistic, pessimistic, balanced)
- d. Assessments regarding the confidence shown by the subjects of the interview
- e. Other appreciations depending on the overall impression

Subject name	Interview form number
Field of study	Female ☐ Male ☐

INTERVIEW GUIDE* for students

Interviewer name	Date
------------------------	------------

Thank you for taking the time to speak with us today.

Our name is

We are a team participating in the research on "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa", necessary for our university to know the problems of the agri-food field and the skills needed by specialists in the field in order to develop holistic agriculture.

We assure you that we will only make your answers known in a centralized form without the possibility of association with your name. We'll take notes just so we don't miss anything important from the discussion. These notes and the discussion we will have are confidential (they are only for us and will not be available to any administrative institution).

We will talk about the possibilities of employment or doing a business in the agri-food sector.

Please feel free to express your opinions. We are here to listen to you.

Question 1 Introductory (5 minutes discussion to relax the atmosphere)

How was 2023? What was the best thing that happened to you professionally?

<i>Synthetic notes</i>

Question 2 Strengths for employment (discussions** will be opinion-oriented)

What do you think are your strengths for employment in the agri-food sector?

Synthetic notes

Question 3 Weak points for employment (*discussions will be opinion-oriented*)

What do you think are your weaknesses for employment in the agri-food sector? Who or what can help you with this?

Synthetic notes

Question 4 Opportunities for employment (*discussions will be opinion-oriented*)

What do you think are the opportunities that can facilitate your employment in the agri-food sector?

Synthetic notes

Question 5 Threats to employment (*discussions will be opinion-oriented*)

What do you think are the economic difficulties that can limit your employment in the agri-food sector?

Synthetic notes

Question 6 Strengths for entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the strengths you have that are useful for starting an agribusiness?

Synthetic notes

Question 7 Weak points for entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the weaknesses that will make it difficult for you to start an agribusiness? Who or what can help you with this?

Synthetic notes

Question 8 Opportunities for entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the opportunities that can be fruitful for starting an agribusiness?

Synthetic notes

Question 9 Threats to entrepreneurship (*discussions will be opinion-oriented*)

What do you think are the economic difficulties that can prevent you from starting an agribusiness?

Synthetic notes

Question 10 Competencies for employment in agribusiness (*opinion discussions*)

What do you think are the top 3 skills you need if you want to work in a company that implements holistic agriculture?

(*Arguments and examples for these are expected*)

Synthetic notes

Question 11 Competencies for agribusiness entrepreneurship (*discussions about subjects' views on what an entrepreneur in this field needs to know, be able to do*)

What do you think are the top 3 skills you need to have to implement holistic agriculture in your own business?

(*Arguments or examples are requested for these*)

Synthetic notes

Thank you for helping us understand some things about your business. This information is valuable and will be useful in the development of this field of activity.

Debriefing-ul echipei de interviatori după interviu

- a. Assessments regarding subjects' willingness to participate in discussions
- b. Assessments regarding the general ambience of the interview
- c. Assessments regarding mood (optimistic, pessimistic, balanced)
- d. Assessments regarding the confidence shown by the subjects of the interview
- e. Other appreciations depending on the overall impression

Appendix 2: General Questionnaire

Good day,

Thank you for taking the time to complete this questionnaire. Our aim is to identify specific needs, constraints, and methods to stimulate entrepreneurial thinking within the holistic agri-food context. Please fill it out honestly and in detail.

The questionnaire seeks to highlight the perspectives of students, researchers, and entrepreneurs on the challenges and opportunities in the holistic agri-food sector, identifying effective solutions and strategies to stimulate innovation and sustainable development.

Your responses are highly valuable to our efforts to support growth and innovation in this vital sector of the economy. Please carefully complete the questions and help us get a comprehensive view of the situation.

Thank you once again for your participation.

Sincerely,

The Research Team

I. Identification of Needs, Constraints, and Methods for Stimulating Entrepreneurial Thinking

1. What do you consider to be the most significant needs for stimulating entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options)
 - Access to financing and financial resources;
 - Education and specialized entrepreneurial training in the holistic agri-food field;
 - Access to mentoring and advice from experts in the field;
 - Development of support networks among holistic agri-food entrepreneurs;
 - Others: _____
2. What are the main constraints you encounter in developing entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options)
 - Bureaucracy and excessive regulations in the agri-food industry;
 - Lack of access to adequate resources and infrastructure for innovation in the holistic agri-food field;
 - Difficulties in accessing markets for innovative agri-food products;
 - Others: _____
3. What methods do you consider most effective for stimulating entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options)
 - Organizing mentorship programs and practical internships in holistic agri-food industry companies

- Facilitating access to financing and start-up resources for entrepreneurs in the holistic agri-food field
 - Developing education and training programs specifically tailored to the holistic agri-food field
 - Creating innovation hubs and centers in the holistic agri-food field to stimulate collaboration and innovation
 - Others: _____
4. What are the biggest challenges you face in developing entrepreneurial thinking in the holistic agri-food field?
-
5. What do you think the government or educational institutions should do to stimulate entrepreneurial thinking in the holistic agri-food sector? (Select up to 3 options)
- Implementing specialized entrepreneurial education programs in the holistic agri-food field in schools and universities, focusing on developing critical thinking, innovation, and business management skills.
 - Developing mentorship programs and business incubators specialized in the holistic agri-food sector to provide support and guidance in the early stages of business development.
 - Developing applied research programs and technology transfer in collaboration with research institutions and the agri-food industry to support innovation and the development of sustainable technologies in the holistic agri-food field.
 - Initiating awareness and promotional campaigns for business opportunities in the holistic agri-food sector to attract more young people and professionals to this field.
 - Implementing support programs for innovation and start-ups in the holistic agri-food sector by granting subsidies, tax facilities, and access to research infrastructure and resources.
 - Others: _____
6. Please imagine you are involved in a start-up project in the holistic agri-food field. What strategies or initiatives would you implement to stimulate entrepreneurial thinking in your team and overcome any potential obstacles encountered?
-

II. Identification of Needs for Stimulating Innovation Potential

7. What do you consider to be the greatest needs for stimulating the innovation potential in the holistic agri-food field? (Select up to 3 options)
- Access to research facilities and specialized laboratories in the holistic agri-food field
 - Support for the development and testing of new technologies and production methods in the holistic agri-food field
 - Access to financing and resources for research and development projects in the holistic agri-food field
 - Development of networks and partnerships between researchers, entrepreneurs, and students in the holistic agri-food field

- Others: _____
8. How do you think access to resources and support for innovation in the holistic agri-food field could be improved? (Select up to 3 options)
- Increasing government investments in research and development in the holistic agri-food field
 - Facilitating access to financing programs and grants for innovation projects in the holistic agri-food field
 - Developing online platforms or innovation hubs for sharing knowledge and resources in the holistic agri-food field
 - Creating mentorship and consultancy programs for entrepreneurs and researchers in the holistic agri-food field
 - Others: _____
9. Innovation in the holistic agri-food field is essential for the sustainable development of rural communities. Please rate how much you agree with this statement on a scale from 1 to 5. (1 - strongly disagree, 2 – disagree, 3 – neutral, 4 - agree, 5 - strongly agree).
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
10. What are, in your opinion, the biggest obstacles that hinder innovation in the holistic agri-food field?
-
11. What solutions or initiatives do you think could be implemented to stimulate innovation in the holistic agri-food field? (Select up to 3 options)
- Partnerships between research institutions and farms/agribusinesses
 - Funding programs and subsidies for agri-food startups
 - Development of technological infrastructure
 - Ongoing professional education and training
 - Favorable policies and regulations for innovation
 - Others: _____
12. Please imagine you are involved in a research or entrepreneurship project in the holistic agri-food field. How would you approach and develop this project to maximize its innovation potential and impact on your community? (Select up to 3 options).
- Identifying specific community needs and challenges
 - Interdisciplinary collaboration: agrotechnology, nutrition, sustainability, and entrepreneurship
 - Implementing emerging technologies such as artificial intelligence, drones, and data-based solutions
 - Organizing workshops and seminars to educate the community about the importance of sustainability in agri-food and the benefits of innovations
 - Establishing strategic partnerships with local governmental organizations and NGOs
 - Others: _____

III. Collaboration in Holistic Agri-food Innovation

13. What do you consider to be the main benefits of collaboration between researchers, students, and entrepreneurs in holistic agri-food innovation? (Select up to 3 options)
- Access to diverse knowledge and expertise
 - Generation of innovative ideas and solutions through the synergy of different perspectives
 - Acceleration of technology transfer from research to industry
 - Increased funding opportunities for innovation projects
 - Others: _____
14. To what extent do you believe collaboration between researchers, students, and entrepreneurs can contribute to the development of innovations in the holistic agri-food sector? (Please rate the effect on a scale from 1 to 5. (1 - no effect, 2 - low effect, 3 - medium effect, 4 - significant effect, 5 - major effect)).
- 1 2 3 4 5
15. What are the main obstacles or constraints encountered in the collaboration between researchers, students, and entrepreneurs for innovation in the holistic agri-food sector? (Select up to 3 options)
- Lack of communication and cooperation among different stakeholders
 - Differences in objectives and priorities between researchers, students, and entrepreneurs
 - Lack of financial resources for collaborative innovation initiatives
 - Linguistic or cultural barriers in communication and mutual understanding
 - Others: _____
16. How do you think these obstacles can be overcome to facilitate collaboration and innovation in the holistic agri-food sector? (Open response)
-

IV. Identification of Needs and Motivations for Innovation

17. What do you consider to be the main reasons why students and entrepreneurs in agriculture would want to become innovators in the holistic agri-food field? (Select up to 3 options)
- The opportunity to contribute to the sustainable development of rural communities
 - The desire to create innovative solutions for problems in the agri-food industry
 - The prospect of obtaining financial benefits and increasing business profitability
 - The possibility of developing and promoting healthy and ecological food products
 - Others: _____
18. To what extent do you think education and training in innovation are important for students and entrepreneurs in the holistic agri-food field? (Please rate the effect on a scale from 1 to 5. (1 - not at all important, 2 - unimportant, 3 - neutral, 4 - important, 5 - very important)).
- 1 2 3 4 5
19. What are the main obstacles or constraints that students and entrepreneurs in agriculture face in becoming innovators in the holistic agri-food field? (Select up to 3 options)

- Lack of access to financial and technological resources to develop and implement innovations
- Bureaucracy and excessive regulations in the agri-food sector
- Lack of knowledge and expertise in the field of innovation and innovation management
- Resistance to change and conservative mindset in the traditional agricultural environment
- Others: _____

20. How do you think these obstacles should be addressed to support students and entrepreneurs in the innovation process in the holistic agri-food field? (Open response)

21. Imagine you are an agriculture student passionate about developing an innovative business in the holistic agri-food field. What steps would you follow to turn your idea into reality and overcome any potential obstacles encountered?

- Conducting thorough research and learning about holistic agri-food concepts and practices to gain a solid understanding of the field.
- Developing a detailed business plan that includes strategic objectives, implementation strategies, and financial projections for the holistic agri-food business.
- Identifying and engaging a mentor or consultant with experience in the holistic agri-food field to provide guidance and support in the business development process.
- Attending events and conferences in the field of agriculture and healthy eating to expand your network of contacts and obtain feedback from professionals in the field.
- Developing partnerships with local farmers and organic food producers to ensure a stable source of raw materials for the business.
- Identifying funding sources such as grants for startups or loans for young entrepreneurs to support the development and launch of the business.
- Creating and promoting a strong brand identity that highlights the commitment to sustainable practices and quality products within the holistic agri-food field.
- Others: _____

V. Identification of Needs and Opportunities for Transformation

22. What do you consider to be the main opportunities for transforming businesses in the holistic agri-food sector? (Select up to 3 options)

- Development of organic and healthy food products
- Implementation of sustainable and ecological agricultural practices
- Use of digital technologies and IoT (Internet of Things) to optimize agricultural processes
- Expansion of markets and access to consumer segments oriented towards natural and local products
- Others: _____

23. To what extent do you believe that transforming businesses in the holistic agri-food sector can contribute to their competitiveness and sustainability? (Please rate the effect on a scale from 1 to 5. (1 - no effect, 2 - low effect, 3 - medium effect, 4 - significant effect, 5 - major effect).

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
24. What are the main obstacles or constraints faced by businesses in the process of transformation in the holistic agri-food sector? (Select up to 3 options)
- High costs associated with implementing sustainable agricultural practices and certifying organic products
 - Lack of access to financial resources and investments for modernizing infrastructure and agricultural technologies
 - Resistance to change and lack of expertise in the holistic agri-food field
 - Legislative and regulatory barriers to adopting ecological practices and quality standards
 - Others: _____
25. How do you think these obstacles can be overcome to facilitate the transformation process of businesses in the holistic agri-food sector? (Open response)
-
26. Imagine you are an agricultural entrepreneur wishing to transform your traditional business into one focused on the holistic agri-food sector. What would be the first steps you would take, and what resources or support would you seek to achieve this?
- Conducting a current business assessment to identify strengths and areas requiring improvement in preparation for the transition to the holistic agri-food sector.
 - Researching and hiring a consultant or expert in the holistic agri-food field to provide guidance and assistance in the transition process.
 - Identifying and participating in training programs and seminars in the holistic agri-food field to acquire the necessary knowledge.
 - Developing a business plan that includes clear objectives, marketing strategies, and financial projections for the business focused on the holistic agri-food sector.
 - Identifying potential sources of funding, such as government subsidies or loans for agricultural businesses, to support the transition.
 - Establishing partnerships with local suppliers and community organizations to support the procurement and marketing of holistic agri-food products.
 - Participating in agricultural business networks or professional organizations to benefit from the support and experience of other agricultural entrepreneurs who have already made the transition to the holistic agri-food sector.
 - Others: _____

VI. Identification of Transformative Innovations

27. What do you consider to be the most promising innovations with the potential to transform into growing businesses in the holistic agri-food sector? (Select up to 3 options)
- Using blockchain technologies for supply chain tracking and authentication of organic food products
 - Development of alternative foods such as plant-based burgers or meat substitutes
 - Implementing urban agriculture systems and local food production in cities

- Using artificial intelligence and robots in agricultural processes to optimize yield and reduce costs

- Others: _____

28. How do you think these innovations can contribute to the growth of businesses in the holistic agri-food sector? (Please rate the effect on a scale from 1 to 5. (1 - no effect, 2 - low effect, 3 - medium effect, 4 - significant effect, 5 - major effect).

1 2 3 4 5

29. What are the main obstacles or constraints faced by innovations in transforming into successful businesses in the holistic agri-food sector? (Select up to 3 options)

- Lack of investment capital and financing for developing and scaling innovations
- Regulatory and bureaucratic barriers to introducing innovations to the market
- Resistance from traditional consumers or producers to adopting new technologies or products
- The need to educate and inform the market about the benefits of innovations
- Others: _____

30. How do you think opportunities can be maximized and constraints overcome to support the transformation of innovations into successful businesses in the holistic agri-food sector? (Open response)

31. Imagine you are involved in developing an innovation in the holistic agri-food field, such as a new technology for processing organic foods. What strategies and tactics would you implement to ensure that your innovation successfully transforms into a growing business and gains market acceptance? (Select up to 3 options)

- Identifying market needs and technological gaps to develop a valuable solution.
- Close collaboration with experts in the agri-food field for efficient implementation.
- Continuous testing and adjustment based on customer feedback.
- Establishing strategic partnerships for a stable source of raw materials and efficient distribution.
- Developing a solid business plan, including detailed financial analyses and realistic projections.
- Expanding production capabilities and infrastructure to meet increasing demand.
- Implementing an education and training program to promote the use of technology
- Others: _____

Thank you for your contribution to this study. Your opinion is essential for understanding the potential for innovation and growth in the holistic agri-food sector.

Appendix 3: Focus Group Plan

Focus Group Plan for Kenya Holistic Agri-food Entrepreneurship

Focus Group session Objectives

1. Identification of needs, constraints, and specific methods to stimulate entrepreneurial thinking
2. Identification of needs, constraints, and specific methods to stimulate innovation potential
3. Analysis of the potential to create innovations in a triadic relationship between researchers, students, and entrepreneurs in holistic agriculture
4. Analysis of the potential for students and entrepreneurs in agriculture to become innovators in holistic agriculture
5. Analysis of the potential for transforming businesses in holistic agriculture
6. Exploring the potential for innovations to evolve into growing businesses

Discussions within the group will be structured according to the SWOT analysis categories focusing on two main components: weaknesses and threats (on one hand) and strengths and opportunities (on the other). Proposals for actions will be requested for each of these categories.

Entities and Representatives to Participate in the Focus Group Sessions:

1. Universities and Research Institutions: A researcher or professor specializing in sustainable agriculture, with expertise in innovative holistic cultivation methods.
2. Producers and Farmers: An innovative farmer or a leader of an agricultural association who has already implemented or is interested in holistic practices.
3. Consumers: A representative of a consumer protection organization or a consultant on consumer behavior, who can provide insights on the demand for sustainable agricultural products.
4. Supply Chain Companies: A procurement or logistics manager from an agri-food company, interested in building sustainable and efficient supply chains.
5. Investors and Investment Funds: An analyst or fund manager who understands the agricultural market and is interested in investing in socially and environmentally impactful projects.

6. International Organizations: A representative from an organization such as the FAO or the World Food Programme, experienced in promoting holistic agriculture globally.

7. Church: A religious leader or a representative of a charitable organization connected to the church, promoting moral values of caring for the environment and community.

8. Cultural Institutions: A curator or program director from an agricultural museum or cultural center, who can highlight the connection between traditions and sustainable agriculture.

9. Banks: A loan officer or a portfolio manager specializing in agricultural financing, who understands the risks and opportunities associated with investments in sustainable agriculture.

10. Government and Regulatory Authorities: An official or agricultural policy analyst who develops regulations, programs, and subsidies to support sustainable agriculture nationally.

11. NGOs: A project manager or program director who coordinates sustainable development initiatives in rural areas, experienced in working directly with farmers and communities.

Moderators:

- At least 1 researcher from the IULS Romania team with roles including: directing discussions towards objectives; ensuring the engagement of all participants; managing time; providing clarifications; compiling the final report.

- At least 2 researchers from the host university team with roles including: ensuring the engagement of all participants; observing non-verbal language, noting the main ideas provided by participants; compiling the final report.

The Focus Group session will be conducted in two stages: Thematic Discussions and Interactive Workshops.

Thematic Discussions

Thematic discussions will be conducted with the participation of all representatives.

Each objective will be allocated approximately 15 minutes.

Responses from participants will be solicited for each objective, and the rapporteur (a researcher moderator from the host university team) will record the responses of each participant in the form of keywords (see Appendix 2). The table will be projected and completed during the discussions to be corrected and filled in real-time.

Questions for each objective will include:

Objective 1: Identifying the needs, constraints, and specific methods to stimulate entrepreneurial thinking

- "What do you consider to be the main cultural, economic, or educational barriers that hinder the development of entrepreneurial thinking in your community? How do these affect the initiative and ability to start new businesses in the agri-food sector?"

- "What resources do you believe could be mobilized, and what opportunities could be leveraged to support the development of entrepreneurial thinking? How could these resources be used to create a more favorable environment for entrepreneurial initiative?"

Objective 2: Identifying the needs, constraints, and specific methods to stimulate the innovation potential

- "What do you consider to be the main cultural, economic, or technological barriers that hinder innovation in the agri-food sector in your community? How do these obstacles affect locals' ability to adopt or develop new agricultural technologies and practices?"

- "What existing resources in your community could be used to support and stimulate innovation in the agri-food sector? What unexplored opportunities do you think could be utilized to promote an innovative environment in this sector?"

Objective 3: Analyzing the potential to create innovations in a triadic relationship among researchers, students, and entrepreneurs in holistic agriculture

- "In your experience, what elements facilitate or, on the contrary, obstruct effective collaboration between researchers, students, and entrepreneurs in developing innovations for a holistic agri-food sector? How could these interactions be improved to maximize the innovative potential?"

- "What types of joint projects between these groups have you observed that generate the most valuable innovations in holistic agriculture? Are there specific areas where synergy between research, practice, and entrepreneurship could be amplified?"

Objective 4: Analyzing the potential for students and entrepreneurs in agriculture to become innovators in holistic agriculture

- "What are the main skills that students and entrepreneurs in your community possess, which could help them contribute to innovations in holistic agriculture? What gaps exist, and how might these be addressed?"

- "What motivational factors do you believe would more actively encourage the involvement of students and entrepreneurs in the innovation processes in holistic agriculture? What are the main obstacles they encounter in this journey?"

Objective 5: Analyzing the potential for transforming businesses in holistic agriculture

- "What examples of innovations in holistic agriculture have had a significant impact on transforming local businesses? How have these changes been perceived by the community and the market?"

- "What opportunities do you identify for scaling and expanding innovative practices in holistic agriculture? What are the main markets or sectors that could benefit most from these innovations?"

Objective 6: The potential for innovations to transform into growing businesses

- "How have specific innovations in holistic agriculture contributed to the growth and development of businesses in your community? Do you have concrete examples of success that could be replicated?"

- "What factors do you consider essential for turning an innovation in holistic agriculture into a successful commercial business? How can challenges related to financing, market, and regulations be addressed?"

Interactive Workshops

Thematic discussions will be conducted in 3 teams:

Team 1: Innovation and Policy:

- Government or Regulatory Authority Representative
- University or Research Institution Representative
- NGO Representative
- Banking Representative

Team 2: Implementation and Market Impact:

- Producers and Farmers Representative
- Procurement or Logistics Manager from an Agri-food Company
- International Organization Representative
- Investor or Investment Fund Representative

Team 3: Community and Culture:

- Religious Leader or Charity Organization Representative
- Consumer Representative
- Cultural Institutions Representative

Each objective will be allocated approximately 15 minutes.

Responses will be solicited from participants at each objective.

Each team will include a rapporteur (a researcher/moderator from the host university/IULS team) who will record the responses of each participant in the form of keywords and conclusions.

Questions for each objective in the interactive workshops will include:

Objective 1: Identifying the needs, constraints, and specific methods to stimulate entrepreneurial thinking

Based on the limiting factors and opportunities identified, what specific actions do you propose to improve and stimulate entrepreneurial thinking in agriculture? What concrete steps should be followed to turn these ideas into effective practices?"

Objective 2: Identifying the needs, constraints, and specific methods to stimulate innovation potential

Given the constraints and resources discussed, what specific actions do you recommend to improve and stimulate the innovation potential in the community's agriculture? What concrete steps should be implemented to transform these resources and opportunities into solutions aimed at stimulating innovation potential?

Objective 3: Analyzing the potential to create innovations in a triadic relationship among researchers, students, and entrepreneurs in holistic agriculture

Considering the current dynamics among researchers, students, and entrepreneurs, what concrete strategies do you propose to strengthen this network and stimulate a steady flow of innovations? What specific roles should each group assume to optimize collaboration and outcomes?"

Objective 4: Analyzing the potential for students and entrepreneurs in agriculture to become innovators in holistic agriculture

What concrete initiatives or programs do you propose to support and encourage students and entrepreneurs to become leaders in innovation in holistic agriculture? How could academic institutions, companies, and the government collaborate to achieve this goal?

Objective 5: Analyzing the potential for transforming businesses in holistic agriculture

What strategies do you consider essential to facilitate the transformation of traditional agriculture businesses into innovative and sustainable entities? What role should different economic and institutional actors play in this process?

Objective 6: The potential for innovations to transform into growing businesses

What specific strategies and measures do you propose to support the transformation of innovations in holistic agriculture into scalable and profitable businesses? What role should cross-sector collaborations and government support play in this process?

Confidentiality and Data Protection

To ensure transparency and protection of personal data during our focus group sessions, each participant will be informed about how the collected information will be used and protected.

Participants are asked to sign an informed consent form before the discussions begin, detailing the purpose of data collection, its use, and the rights they have under current data protection legislation.

All personal data will be treated with the utmost confidentiality, kept securely, and will only be accessible to the authorized research team. Audio and video recordings will be used exclusively for the purposes of documenting and analyzing the information discussed, and will not be published or distributed without the explicit consent of the participants. The identity of the participants will be kept anonymous in all reports and publications resulting from these sessions.

After the study is completed, all personal data will be deleted or archived according to legal standards, ensuring long-term protection and confidentiality. We are committed to respecting and protecting the privacy of each participant and ensuring that all data collection and analysis processes are conducted in accordance with the highest ethical and legal standards. For any questions or clarifications related to personal data management, participants can contact our data protection officer at dan.bodescu@iuls.ro.

Final Aspects

For the efficient organization of the focus group sessions, the following logistical aspects must be considered:

Location: Booking appropriate spaces at SEKU and JOOUST, arranged to facilitate group discussions, preferably with round tables or in a U-shape to encourage interaction.

Technical Equipment: Ensure projectors and screens, audio recording devices are available.

Name Tags: For easy identification of participants and to facilitate communication.

Invitations and Confirmations: Sending invitations (template included in this document) in a timely manner and tracking participation confirmations. Reminder messages to participants on the day before the event.

Focus Group Invitation Template

Project Title: "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa"

Dear (Participant Name),

We are pleased to invite you to participate in the focus group session organized as part of the project "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa," which will take place at (University/Location), on (Date), at (Time).

Purpose of the Focus Group:

To explore together the strategies and possibilities for the following objectives:

- Stimulating entrepreneurial thinking and innovation in holistic agriculture.
- Identifying needs, constraints, and opportunities in this field.
- Creating synergies between researchers, students, and entrepreneurs.

Event Agenda:

- Introduction and presentation: Objectives of the project and the focus group session.
- Thematic discussions: Entrepreneurial thinking, innovation in holistic agriculture, collaboration.
- Interactive workshops: Identifying challenges and practical solutions.
- Conclusions: Summarizing the discussed ideas and recommendations.

Your participation is essential for the success of this initiative, and your valuable contribution will help create relevant strategies for stimulating innovation in holistic agriculture.

Please confirm your participation by (Deadline Date) by contacting us at (Phone Number/Email).

Sincerely,
(Signature)
(Organization / Department)

Thematic Discussions Summary Template

Participants	Objectives					
	1	2	3	4	5	6
Universities and research institutions						
Producers and farmers						
Consumer representatives						
Agri-food supply chain companies						
Investors and investment funds						
International organizations						
The Church						
Cultural institutions						
Banks						
Government						
NGOs						

Informed Consent Form for Participation in Focus Group

Project Title: Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa

Organizers:

Date:

Location:

Purpose of the Focus Group: To explore and develop strategies for stimulating entrepreneurial thinking and innovation in holistic agriculture.

Project Description:

This focus group is part of a broader study aimed at identifying and analyzing the opportunities and challenges in holistic agriculture in Sub-Saharan Africa. The purpose of the session is to collect data and opinions from participants on various specific topics, which will be used to form recommendations and strategies within the context of the mentioned project.

Procedure: During the focus group, you will be asked to participate in group discussions led by a moderator. Discussions will be recorded in audio and/or video to ensure the accuracy of the information collected. The session is expected to last approximately [number] hours.

Confidentiality: All personal information collected during this focus group will be kept confidential. Your identity will not be disclosed in any report or publication resulting from this project, and the collected data will be presented only in aggregated or anonymized format.

Participant Rights: Your participation is voluntary, and you have the right to withdraw from the study at any time without any effect on your relationship with the organizers or the host institution.

Consent:

By signing this form, you confirm that you have understood the information presented and agree to participate in this focus group. You also agree to the audio/video recording of the discussions in which you will participate.

Contact: For any questions related to the study or your rights as a participant, you can contact [Name and contact of the data protection officer or researcher from the host institution].

Participant Signature:

Date:

Researcher/Project Manager Signature:

Date:

APPENDIX 4: SOUTH EASTER KENYA UNIVERSITY VISIT

South Eastern Kenya University-Kitui Kenya, *captured by secretary.*



The incubation garden hub at SEKU



a) Cassava plantation, captured by Brenda.



b) Maize plantation, captured by Brenda.



c) Sweet potatoes, cassava and Mango trees, captured by S. Photographer.

Incubation poultry hub at SEKU



Photos captured by Brenda



d) Banana plantations, *captured by Brenda.*

Livestock-SEKU



a) Cows (dual purpose local and crossbreeds), *captured by Brenda.*



b) Goats & sheep, captured by Brenda.

SEKU INCUBATION LABORATORY



Dry cowpeas leaves, captured by D. Bukekhe.



Mango flakes-SEKU lab, captured by D. Bukekhe.



Packaging dried cow peas leaves and mango flakes at SEKU, captured by D. Bukekhe

Thematic discussions at SEKU



Focus group discussion at SEKU, captured by Brenda.

Interactive workshops at SEKU



Sub-groups during focus group discussion at SEKU, *captured by group leader.*

KITUI FARM VISIT



Farm visit in Kitui- medium scale farmer-mango plantations and mango juice processing/lipstick balm from mango, banana plantations, chicken, sunflower, dairy cows and goats. *A photo captured by Brenda.*



The farm owner giving an overview of the farm, *captured by Brenda.*



Mango and sunflower plants, *captured by Brenda.*



Mango and banana plantation, *captured by Brenda.*



Poultry unit, *captured by Brenda.*



An entrepreneur explaining mango juice processing procedure, *captured by S. photographer.*

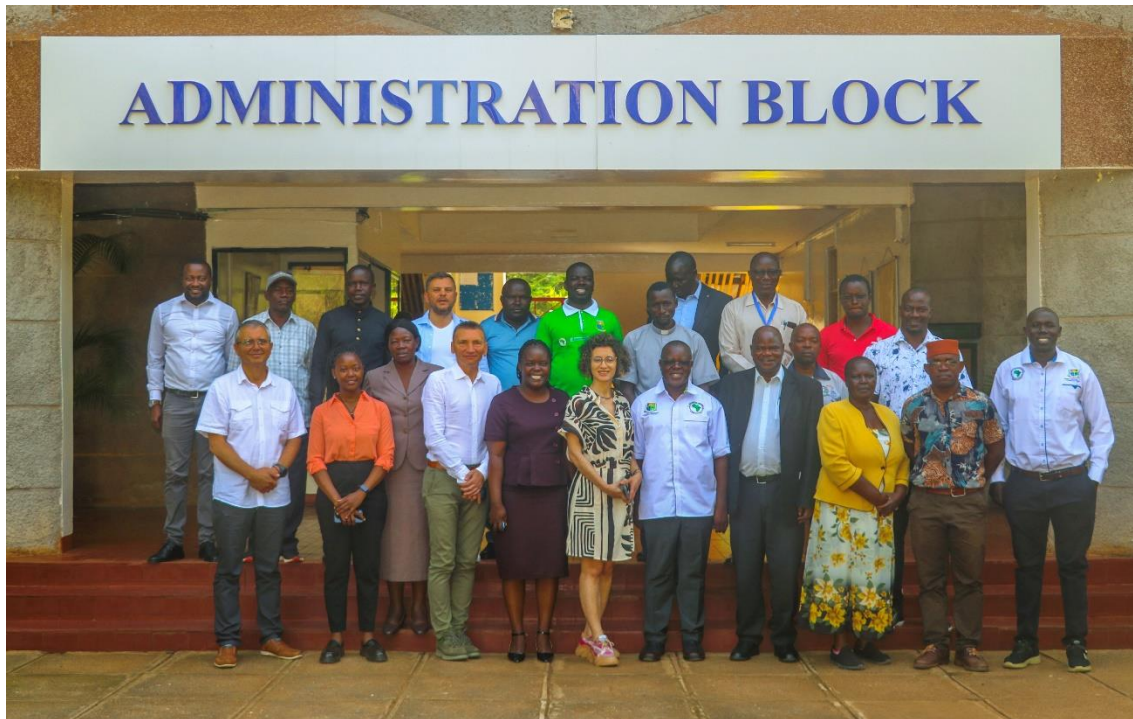


Sunsweet mango processing unit (mango flakes, lipstick, mango jam, mango juice) *captured by Brenda.*



Dairy unit, *capture by Brenda.*

APPENDIX 5: JOOUST FOCUS GROUP MEETING



JOOUST focus group officials and Romania team, *captured by JOOUST photographer.*



A pre-meeting with JOOUST officials and Romania team, *captured by JOOUST photographer.*



Thematic discussion at JOOUST, *captured by Brenda.*

JOOUST SERICULTURE



JOOUST SERICULTURE Unit, a *photo captured by Brenda*



Mulberry tree used to make wine, medicinal herb for ulcers and jam at JOOUST (inside sericulture unit).
Capture by Brenda



Silkworm produces white cotton like substances used for silk material formation (inside JOOUST sericulture). *A photo captured by Brenda.*



Silk material formation from silkworm (inside JOOUST sericulture), *a photo captured by Brenda.*



Silk material used to make scarf-JOOUST sericulture, *a photo captured by JOOUST photographer.*

JOOUST INSECTARIUM



Cricket rearing, a photo captured by Brenda



JOOUST Cricket biscuits-processed in the lab from reared crickets in JOOUST insectarium Unit, a photo captured by Brenda.



Black soja flies reared in JOOUST insectarium Unit, *captured by Brenda & JOOUST photographer.*

JOOUST AQUACULTURE SECTION (Recirculating aquaculture System)



Fingerlings rearing, a *photo captured by Brenda.*



JOOUST Fish farming Unit, a *photo captured by Brenda.*