RESEARCH REPORT

D1.7 – Analysis report of HA innovation and business transformation potential at partner HEIs

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Contents

1. GENERAL RESEARCH PLAN

As a vital sector, agriculture has highlighted the importance of adopting innovative approaches, such as holistic approaches that integrate sustainable practices and promote a balance between environmental efficiency and social responsibility.

The analysis explored the potential for innovation and transformation in holistic agribusiness at partner universities. By examining previous attitudes toward holistic learning, the use of different methodologies, and access to training opportunities, the research aimed to provide detailed recommendations for improving teaching practices and the impact of holistic agribusiness education at the partner institutions.

In the context of globalization, deepening the innovative dynamic in higher education institutions has become essential.

1.1 Research aims and objectives

This report's research aimed to analyze the potential for innovation and transformation in holistic agribusiness practices in the partner universities. It focused on assessing how the pedagogical methods used stimulate innovation and transformation in the agricultural sector.

By exploring entrepreneurs', teachers', and students' perceptions of innovation in teaching and learning in holistic agriculture, the study explored different pedagogical approaches and identified opportunities for improving teacher training in this area.

The research used mixed methods, including literature reviews and online questionnaires, complemented by focus group sessions with teachers, students, and business representatives. The aim was not only to capture current innovations in holistic agricultural education but also to provide strategic recommendations for integrating these innovative and effective practices into the curriculum.

The aim was to promote sustainable teaching practices and facilitate adaptation to an evolving academic and agribusiness environment. The research plan included three main objectives, tailored to the specificities of each partner institution, with a particular focus on identifying and applying the most effective pedagogical methods to support innovation and transformation in holistic agriculture.

1.2 Methodological plan

The need to update information on how innovative approaches to holistic agricultural education can transform higher education drove this endeavor. Using cutting-edge research methods, including online questionnaires and focus group sessions, the study aimed to analyze the perspectives of academics, students, and the business community on the adoption of innovation and holistic agricultural practices.

The main aim was to identify the specific challenges, opportunities, and needs of these groups, thereby facilitating the development of recommendations for teacher training in holistic agricultural innovation. Through data collection and analysis, the research aimed to develop a set of core competencies and tailored strategies for the educational needs of the holistic

agriculture sector, thus contributing to the strengthening of an innovative and sustainable educational environment in higher education institutions.

This approach, which integrates the analysis of educational needs with the identification of required competences, aims to develop strategies tailored to each partner institution. This research aims to continuously improve teaching practices and foster a robust, innovative, and adaptable higher education learning environment.

We aimed the online questionnaire at the same groups, not only to complete and verify the interview data but also to identify specific needs for support in innovation and holistic agriculture. The questionnaire had the following objectives: a) To identify specific needs for support in innovation and holistic agriculture among entrepreneurs. b. For teachers—to identify gaps in the skills needed to effectively teach holistic agriculture concepts. c. For students—to identify critical skills and barriers to accessing innovation and holistic agriculture. We produced summary reports from the findings to guide the development of training programs.

Focus group sessions reinforced the results of the interviews and questionnaires through in-depth discussions with members of the academic and entrepreneurial community, exploring the links between the innovative educational environment and the skills required, with a focus on the skills essential for innovation in holistic agricultural education.

1.3 Results and discussions

Interdisciplinarity is crucial in entrepreneurial education for holistic agriculture, according to the results of the questionnaires and focus groups. This highlights the necessity of flexibility and cooperation between various academic disciplines to effectively address the unique problems faced by the agricultural industry.

In addition to its capacity to produce creative solutions, interdisciplinarity is praised for its contribution to the development of critical thinking and adaptability—two transversal abilities that are vital to both teachers' and students' ongoing success. The report also emphasized the critical role that innovation plays in the comprehensive agriculture curriculum and the pressing need for educators to embrace creative and flexible teaching approaches. In order to solve issues and maximize prospects for the agricultural education sector, educators and educational entrepreneurs are urged to investigate and put into practice cutting-edge methods that have the potential to revolutionize the field.

The study looked closely at how various teaching approaches affect students' and teachers' creativity and entrepreneurial thinking. The dynamics of the interactions and feedback obtained throughout the learning sessions demonstrate how the flexibility and caliber of the conversations can have a direct impact on the production of creative ideas that can be used to further enhance teaching methods over time.

These findings, which came from a variety of study approaches, show how intricate and interconnected the elements that support professional and entrepreneurial growth in comprehensive agricultural higher education are. They draw attention to the necessity of a comprehensive and integrated approach to research and teaching, demonstrating how various viewpoints can advance our knowledge of educational needs and help find long-term, practical solutions that will foster innovation in agricultural education.

A thorough understanding of the efficacy of the teaching strategies used in the partner universities is provided by the examination of the questionnaire and focus group results, which highlights the value of flexibility and creativity in tackling the intricate problems of holistic agriculture. Every research methodology shed light on various facets of the demands and opportunities for creativity among educators, emphasizing how an integrated approach may transform learning environments and foster creative thinking unique to holistic farming.

2. RESEARCH USING THE QUESTIONNAIRE METHOD

The results of the questionnaires revealed that although there is a growing interest in adopting holistic farming practices, teachers and farmers face numerous challenges, such as lack of adequate resources and limited knowledge about sustainable technologies. This underlines the need to develop training programs and workshops to enhance skills in innovation and sustainability management.

In addition, interdisciplinary collaboration between universities and the agri-food industry was identified as a necessary catalyst to accelerate the uptake of innovations. The integration of practical experience with academic research can generate adaptive solutions that effectively respond to the needs of the dynamic agricultural sector, while promoting a smooth transition towards more holistic and responsible agricultural practices.

2.1 Aim and objectives of the questionnaire

The aims of the questionnaire research derive from the project objectives and consist of:

I. To identify needs, constraints and methods to stimulate entrepreneurial thinking
II. To identify ways to stimulate innovation potential
III. Collaboration 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. Identification of innovations with transformative potential

Identifying needs, constraints, and methods to stimulate entrepreneurial thinking is a crucial task. This objective aims to explore and measure the factors influencing entrepreneurial thinking capacity within the academic community and agri-food stakeholders. The goal is to identify the primary obstacles and educational requirements that require attention to cultivate and enhance strong entrepreneurial abilities.

Identifying ways to stimulate innovation potential is the focus of this objective, which aims to discover and assess methods and practices that can enhance innovation in educational institutions and agri-food enterprises. The investigation will focus on maximizing innovation potential through the use of emerging technologies, supportive policies, and cross-sectoral collaborations.

Collaboration in holistic agri-food innovation: The objective focuses on identifying and developing strategic partnerships between academia, industry, and other relevant entities that can contribute to innovation in the agri-food sector. The aim is to create a collaborative network that facilitates the exchange of knowledge and resources needed for holistic innovation.

Iidentifying needs and motivations for innovation: this objective aims to understand what motivates individuals and organizations to adopt innovations and participate in transformative processes. It will investigate how factors such as legislation, financial incentives, and social

pressure influence the decision to innovate. The study will identify the needs and opportunities for transforming conventional businesses into holistic agri-food businesses.

This objective delves into the transformation of conventional farming practices into sustainable and holistic business models. It will analyze the market demand for sustainable products, the availability of resources, and the need for education and support for farmers and businesses. Identifying innovations with transformative potential:

Lastly, this objective focuses on identifying and evaluating specific innovations with the potential to revolutionize the agri-food sector. This includes emerging technologies, innovative business models, and farming practices that promote sustainability and efficiency. Questionnaires have been essential to collect valuable information on the needs and motivations for innovation in the agri-food sector.

Identifying the needs and opportunities for transforming conventional businesses into holistic agri-food businesses as well as recognizing innovations with transformative potential are critical steps in developing an innovative and sustainable agri-food sector. This research provides a solid basis for formulating effective strategies and stimulating entrepreneurial and innovative thinking in agriculture.

2.2 Research using the questionnaire method

The research sample was composed of three main categories: entrepreneurs, students, and teachers/researchers, selected using the stratified proportional sampling method to ensure the representativeness of each group according to its size in the total population. The sample size and sample structure were determined on the basis of statistical yearbook data for 2022. A problematic aspect of this research was the low proportion of women in these samples, which is why a quota of 30 percent was set to ensure equity and representativeness.

In what follows, the arguments for including a quota for women are presented in terms of the principles of equity and representativeness, compliance with gender policies and international norms, and improving the validity and depth of the data. Adequate representation of women in the survey helps provide a more complete picture of the challenges and needs in the agri-food sector and supports the United Nations Sustainable Development Goals. Therefore, we selected distinct and well-structured samples from universities in Kenya, Nigeria, and Togo.

The researched sample consisted of three categories: entrepreneurs, students, and teachers and researchers.

The sampling method was Proportional Stratified Sampling whereby a proportionate share of respondents was selected from each stratum based on the size of each stratum in the total population. This ensured that each group was adequately represented relative to its importance in the population.

The sample size and sample structure was determined based on statistical yearbook data (2022) in each country.

A difficult issue is the share of women in these samples. Women have low shares in the total population of entrepreneurs, students and teachers/researchers. However, it is important to

know the impact of this variable and therefore a weight of 30 per cent in all samples has been agreed.

Equity and Representativeness: The use of a quota for women supports the principle of equity by ensuring that women's voices are heard in research, even in areas where they are under-represented. 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 Normative: The use of a quota reflects the need to comply with international commitments on gender equality, such as those stipulated by the UN, which emphasise the importance of reducing gender inequality in labour force participation and leadership positions (UN Women; UN Sustainable Development Goals).

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

Cultural and Social Impact: Recognition of unpaid work and domestic responsibilities, predominantly performed by women, requires adequate representation of women in research to bring to light these often overlooked issues. The argument is based on the need to change traditional gender roles and promote an equitable redistribution of labour (UN Women,2022; Krook ML., 2006).

Consequently, the following distinct and distributed samples by universities resulted:

Kenya

SOUTH EASTERN KENYA UNIVERSITY – SEKU

Sample of entrepreneurs

- 13 female entrepreneurs owning a small enterprise engaged in agricultural production
- 29 male entrepreneurs owning a small enterprise engaged in agricultural production
- 5 female entrepreneurs owning a large enterprise engaged in agricultural production
- 11 male entrepreneurs owning a large enterprise engaged in agricultural production
- 1 female entrepreneur owning a small enterprise engaged in processing agricultural products
- 3 male entrepreneurs owning a small enterprise engaged in processing agricultural products
- 1 female entrepreneurs with a large enterprise engaged in processing agricultural products
- 1 male entrepreneurs with a large enterprise engaged in processing agricultural products
- 2 female entrepreneurs with a small enterprise engaged in trade and other services
- 6 male entrepreneurs with a small enterprise engaged in trade and other services
- 0 female entrepreneurs with a large enterprise engaged in trade and other services
- 2 male entrepreneurs with a large enterprise engaged in trade and other services

Sample of students

- 28 female undergraduate students majoring in agricultural production
- 65 male undergraduate students majoring in agricultural production
- 10 female master students majoring in agricultural production

- 23 male master students majoring in agricultural production
- 2 female doctoral students majoring in agricultural production
- 5 male doctoral students majoring in agricultural production
- 3 female undergraduate students majoring in agricultural processing
- 6 male undergraduate students majoring in agricultural processing
- 1 female master students majoring in agricultural processing
- 2 male master students majoring in agricultural processing
- 1 female doctoral students majoring in agricultural processing
- 5 female undergraduate students majoring in commerce and other food service
- 12 male undergraduate students majoring in commerce and other food service
- 2 female master's students with predominantly commerce and other food services
- 5 male master's students with predominantly commerce and other food services
- 1 female doctoral student with predominantly commerce and other food services

Sample of teachers

- 4 women with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management
- 2 women with main field of expertise Food and Nutrition Sciences
- 5 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

ARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY – JOOUST

Sample of entrepreneurs

- 12 female entrepreneurs who own a small enterprise engaged in agricultural production
- 30 male entrepreneurs who own a small enterprise engaged in agricultural production
- 4 female entrepreneurs who own a large enterprise engaged in agricultural production
- 11 male entrepreneurs who own a large enterprise engaged in agricultural production
- 1 female entrepreneur who own a small enterprise engaged in processing agricultural products
- 2 male entrepreneurs who own a small enterprise engaged in processing agricultural products
- 0 female entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 2 male entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 3 female entrepreneurs owning a small enterprise engaged in trade and other services
- 6 male entrepreneurs owning a small enterprise engaged in trade and other services
- 1 female entrepreneur owning a large enterprise engaged in trade and other services
- 1 male entrepreneur owning a large enterprise engaged in trade and other services

Sample of students

- 28 female undergraduate students majoring in agricultural production
- 66 male undergraduate students majoring in agricultural production
- 10 female master students majoring in agricultural production
- 24 male master students majoring in agricultural production
- 2 female doctoral students majoring in agricultural production
- 4 male doctoral students majoring in agricultural production
- 2 female undergraduate students majoring in agricultural processing
- 6 male undergraduate students majoring in agricultural processing
- 1 female master students with predominant field of studies in agricultural processing and other food services
- 2 female master students with predominant field of study in commerce and other food services
- 4 male master students with predominant field of study in commerce and other food services
- 1 female doctoral student with predominant field of study in commerce and other food services
- 2 male doctoral students with predominant field of study in commerce and other food services

Sample of teachers

- 3 women with main field of expertise Agriculture and Agro-technology
- 8 men with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management
- 3 women with main field of expertise Food and Nutrition Sciences
- 6 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social Sciences, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

Nigeria

FEDERAL UNIVERSITY NDUFU ALIKE IKWO AE-FUNAI

Sample of entrepreneurs

- 18 female entrepreneurs who own a small enterprise engaged in agricultural production
- 43 male entrepreneurs who own a small enterprise engaged in agricultural production
- 4 female entrepreneurs who own a large enterprise engaged in agricultural production
- 10 male entrepreneurs who own a large enterprise engaged in agricultural production
- 1 female entrepreneur who own a small enterprise engaged in processing agricultural products
- 2 male entrepreneurs who own a small enterprise engaged in processing agricultural products

- 0 female entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 1 male entrepreneur owning a large enterprise engaged in the processing of agricultural products
- 2 female entrepreneurs owning a small enterprise engaged in trade and other services
- 5 male entrepreneurs owning a small enterprise engaged in trade and other services
- 2 female entrepreneurs owning a large enterprise engaged in trade and other services
- 5 male entrepreneurs owning a large enterprise engaged in trade and other services

Sample of students

- 33 female undergraduate students majoring in agricultural production
- 75 male undergraduate students majoring in agricultural production
- 13 female master students majoring in agricultural production
- 28 male master students majoring in agricultural production
- 5 female doctoral students majoring in agricultural production
- 12 male doctoral students majoring in agricultural production
- 2 female undergraduate students majoring in agricultural processing
- 5 male undergraduate students majoring in agricultural processing1 femeie masteranzi cu domeniul de studii predominant în procesarea produselor agricole other food services
- 2 female master students with predominant field of study in commerce and other food services
- 5 male master students with predominant field of study in commerce and other food services
- 1 female doctoral student with predominant field of study in commerce and other food services
- 2 male doctoral students with predominant field of study in commerce and other food services
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Eșantion profesori

- 3 women with main field of expertise Agriculture and Agro-technology
- 8 men with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management
- 2 women with main field of expertise Food and Nutrition Sciences
- 6 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social Sciences, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA FUTMINNA

Sample of entrepreneurs

- 19 female entrepreneurs who own a small enterprise engaged in agricultural production

- 43 male entrepreneurs who own a small enterprise engaged in agricultural production
- 4 female entrepreneurs who own a large enterprise engaged in agricultural production
- 10 male entrepreneurs who own a large enterprise engaged in agricultural production
- 1 female entrepreneur who own a small enterprise engaged in processing agricultural products
- 3 male entrepreneurs who own a small enterprise engaged in processing agricultural products
- 1 female entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 1 male entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 2 female entrepreneurs owning a small enterprise engaged in trade and other services
- 4 male entrepreneurs owning a small enterprise engaged in trade and other services
- 1 female entrepreneurs owning a large enterprise engaged in trade and other services
- 3 male entrepreneurs owning a large enterprise engaged in trade and other services

Sample of students

- 32 female undergraduate students majoring in agricultural production
- 78 male undergraduate students majoring in agricultural production
- 12 female master students majoring in agricultural production
- 31 male master students majoring in agricultural production
- 5 female doctoral students majoring in agricultural production
- 11 male doctoral students majoring in agricultural production
- 2 female undergraduate students majoring in agricultural processing
- 5 male undergraduate students majoring in agricultural processing 1 female master students majoring in agricultural processing
- 2 male master students majoring in agricultural processing
- 6 female undergraduate students majoring in commerce and other food services
- 12 male undergraduate students majoring in commerce and other food services
- 2 female master students majoring in commerce and other food services
- 5 male master students with predominant field of study in commerce and other food services
- 1 female doctoral student with predominant field of study in commerce and other food services
- 2 male doctoral students with predominant field of study in commerce and other food services

Sample of teachers

- 4 women with main field of expertise Agriculture and Agro-technology
- 8 men with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management

- 3 women with main field of expertise Food and Nutrition Sciences 5 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social Sciences, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

Togo
UNIVERSITE DE KARA UK
Sample of entrepreneurs

- 8 female entrepreneurs who own a small enterprise engaged in agricultural production
- 19 male entrepreneurs who own a small enterprise engaged in agricultural production
- 5 female entrepreneurs who own a large enterprise engaged in agricultural production
- 10 male entrepreneurs who own a large enterprise engaged in agricultural production
- 1 female entrepreneur who own a small enterprise engaged in processing agricultural products
- 3 male entrepreneurs who own a small enterprise engaged in processing agricultural products
- 1 female entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 2 male entrepreneurs owning a large enterprise engaged in the processing of agricultural products
- 3 female entrepreneurs owning a small enterprise engaged in trade and other services
- 6 male entrepreneurs owning a small enterprise engaged in trade and other services
- 1 female entrepreneur owning a large enterprise engaged in trade and other services
- 2 male entrepreneurs owning a large enterprise engaged in trade and other services

Sample of students

- 21 female undergraduate students majoring in agricultural production
- 48 male undergraduate students majoring in agricultural production
- 8 female master students majoring in agricultural production
- 17 male master students majoring in agricultural production
- 2 female doctoral students majoring in agricultural production
- 3 male doctoral students majoring in agricultural production
- 3 female undergraduate students majoring in agricultural processing
- 8 male undergraduate students majoring in agricultural product processing
- 1 female master students majoring in agricultural product processing
- 3 male master students majoring in agricultural product processing
- 1 female doctoral students majoring in agricultural product processing
- 6 female undergraduate students majoring in commerce and other food service
- 14 male undergraduate students majoring in commerce and other food service
- 2 female master students with predominant field of study in commerce and other food services

- 5 male master students with predominant field of study in commerce and other food services
- 1 female doctoral student with predominant field of study in commerce and other food services
- 1 male doctoral student with predominant field of study in commerce and other food services

Sample of teachers
- 4 women with main field of expertise Agriculture and Agro-technology
- 8 men with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management
- 2 women with main field of expertise Food and Nutrition Sciences
- 5 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social Sciences, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

UNIVERSITE DE LOME UL

Sample of entrepreneurs
- 8 female entrepreneurs owning a small business enterprise
- 19 male entrepreneurs owning a small business enterprise
- 4 female entrepreneurs owning a large business enterprise
- 11 male entrepreneurs owning a large business enterprise
- 1 female entrepreneur owning a small business enterprise
- 3 male entrepreneurs owning a small business enterprise
- 1 female entrepreneur owning a large business enterprise
- 2 male entrepreneurs owning a large business enterprise
- 2 female entrepreneurs owning a small business enterprise
- 7 male entrepreneurs owning a small business enterprise
- 1 female entrepreneur owning a large business enterprise
- 2 male entrepreneurs owning a large business enterprise

Sample of students
- 20 female undergraduate students majoring in agricultural production
- 48 male undergraduate students majoring in agricultural production
- 7 female master students majoring in agricultural production
- 17 male master students majoring in agricultural production
- 1 female doctoral student majoring in agricultural production
- 4 male doctoral students majoring in agricultural production
- 4 female undergraduate students majoring in agricultural processing
- 8 male undergraduate students majoring in agricultural processing
- 2 female master students with predominant field of study in agricultural processing

- 3 male master students with predominant field of study in agricultural processing
- 1 female doctoral student with predominant field of study in agricultural processing
- 1 male doctoral student with predominant field of study in agricultural processing
- 6 female undergraduate students with predominant field of study in commerce and other food services
- 14 male undergraduate students with predominant field of study in with predominant field of study in commerce and other food services
- 2 female master students with predominant field of study in commerce and other food services
- 5 male master students with predominant field of study in commerce and other food services
- 1 female doctoral student with predominant field of study in commerce and other food services
- 1 male doctoral student with predominant field of study in commerce and other food services

Sample of teachers

- 3 women with main field of expertise Agriculture and Agro-technology
- 8 men with main field of expertise Agriculture and Agro-technology
- 3 women with main field of expertise Economics and Business Management
- 7 men with main field of expertise Economics and Business Management
- 3 women with main field of expertise Food and Nutrition Sciences
- 6 men with main field of expertise Food and Nutrition Sciences
- 3 women with main field of expertise Social Sciences, Behavioural and other relevant sciences
- 7 men with main field of expertise Social, Behavioural and other relevant sciences

The sample structure is indicative and may be modified within 10-20 per cent of each category. Modifications may be determined in particular if the interviewer-researchers consider that a particular size category is more relevant in their country or if there is a need to introduce another link in the agri-food supply chain. For example: 14 entrepreneurs with small, 5 medium and 1 large firm could be interviewed.

Application of the questionnaire

The questionnaire was administered online, digital ofline and in hardcopy for participants unable to respond online or on a PC. The links to the questionnaires for each university

Kenya

SOUTH EASTERN KENYA UNIVERSITY – SEKU

Questionnaire for Entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSeG5Z2-1ccKeUcscmuBtfe3SG9b7dqWHnIO-uae6nO9VZOr-A/viewform?usp=sf_link

Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSdhX_Oe2DMwe8o3oUzle_lP3zUUWo7wP2RNgdkF7qAgOgdOQg/viewform?usp=sf_link

Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLScPvFWz5NadScIJ-fanhtZkH2p3yH9ryX0lw0irJoYbXn96dg/viewform?usp=sf_link

ARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY - JOOUST
Questionnaire for Entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdo5cOhqKanZ4WzmmK_VSN116XO5QrTJZ6BE5P1GhyCoUL9RQ/viewform?usp=sf_link
Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSeJr05Dn7D1lXghYN8xL0Jmbqdepl7y1xcmTyjZdbiXNAVEIA/viewform?usp=sf_link
Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLSefveIYzPKOgLaR3INC86OItkymBDBHcJ9gwfTVtgfqDFI0IQ/viewform?usp=sf_link

Nigeria
FEDERAL UNIVERSITY NDUFU ALIKE IKWO - AE-FUNAI
Questionnaire for Entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdJyoBOVnQ6XwnIa786FYn1LmM7ipvZSeAgvpugPng71YBwJg/viewform?usp=sf_link
Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSegquCDKEa9cIOxWbNO7EY5lwjT8rODMMbkLRThh5FvXl_rmw/viewform?usp=sf_link
Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLSdQyq7NR6hMJLwP9iKabYd2FUup68oyvdKi72GC_LTCzhrtTw/viewform?usp=sf_link

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA - FUTMINNA
Questionnaire for Entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdn4v1YJ0AXfGT-UnLvMwqdoBdfThJqlEH5YGebj1jMW-uttg/viewform?usp=sf_link
Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSejPfZaWsV_pOOH1JMoqHTcxW6wUCw4sle65QzcRk9o1_P63g/viewform?usp=sf_link
Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLSfGNTihdwFV0E3zbEYEkQaG56CiQGpHYX4-SUUvblV7qtA29w/viewform?usp=sf_link

Togo
UNIVERSITE DE KARA - UK
Questionnaire for Entrepreneurs

https://docs.google.com/forms/d/e/1FAIpQLSf1vox-SSehm7cdXVUoOhkU9PsYzbNl9tBCZzFPrkK7KIQq4A/viewform?usp=sf_link
Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSc48G3bDUD85Hs7tAEHd2s-ZbIhsKCeP5BLSMfmV3mksP1CIg/viewform?usp=sf_link
Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLSc2yZGLYRvTwP-Oj9Fb6lu7GX0LCBv3LMaqj7FJL4-4HMLHKA/viewform?usp=sf_link

UNIVERSITE DE LOME - UL
Questionnaire for Entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSercSRH3WwNJFr7vtSENQ_vLUWFvhiazO9m0sOvWqVlNkpVQQ/viewform?usp=sf_link
Questionnaire for Students
https://docs.google.com/forms/d/e/1FAIpQLSedhFbazArr6NxPYQ1OQkGcZyTHJhKJ9u7xGeDBJyWrRqdwPg/viewform?usp=sf_link
Questionnaire for Professors
https://docs.google.com/forms/d/e/1FAIpQLSdEw69lff3BWT0fXgAcWJ-CTrfURJ9t3y-HVKJ9P0SaAmLzEA/viewform?usp=sf_link

The questionnaire was administered online and in hardcopy for participants unable to respond online or on a PC. Questionnaire forms in editable format were attached to the research plan (Appendix 2). Hardcopy responses were converted into digital format by the field researchers. These were uploaded into the excel file attached to this plan.

This research makes a significant contribution to understanding the dynamics and challenges of the agri-food sector in Kenya, Nigeria and Togo. By applying both online and offline questionnaires, it ensured accessibility and inclusion of participants who do not have access to technology, facilitating the collection of comprehensive and representative data. The results obtained will serve as a basis for the formulation of effective strategies and the promotion of innovation and entrepreneurial thinking in the agri-food sector, with a positive impact on sustainable and equitable development.

2.3 Questionnaire results and discussions

The holistic agrifood sector faces a pressing need to adapt and innovate. Entrepreneurship in this sector plays a key role in shaping a sustainable future, but to thrive, entrepreneurs must navigate a landscape full of obstacles and opportunities.

Following an extensive questionnaire designed to capture the perceptions and experiences of entrepreneurs, we have accumulated a number of valuable insights that reflect their drivers, constraints, and needs. This detailed analysis explores different aspects of entrepreneurial thinking and innovation in agri-food, from the importance of access to finance and resources to the crucial role of education and interdisciplinary collaboration.

Therefore, the interpretation of the responses paints a clear picture of what the holistic agri-food sector needs to support and stimulate effective and adaptive entrepreneurial thinking.

1. Key factors and challenges that stimulate entrepreneurial thinking

Funding and resource access

- Entrepreneurs emphasise that access to finance is crucial for starting and sustaining entrepreneurial initiatives.
- Mentoring is seen as an essential means of providing guidance and support to new entrants, helping to develop innovative thinking and overcome challenges.

Education and training

- There is a clear need for educational programmes that promote critical thinking and entrepreneurial skills specific to the agri-food sector.
- Courses should combine theory with practice, providing students and entrepreneurs with real-life experiences and case studies relevant to the industry.

2. Constraints in developing entrepreneurial thinking

Bureaucracy and legal obstacles

- Strict regulations and complicated procedures can discourage innovative ventures, with entrepreneurs calling for simplification to facilitate more start-ups and innovation.
- Respondents call for a more flexible regulatory framework that allows rapid adaptation to changes in the market and technology.

Lack of adequate infrastructure

- Insufficient infrastructure, such as test labs or production facilities, limits the ability to develop prototypes and test innovations.
- There is a need for investment in workspace to support experimentation and new product development.

3. Effective ways to stimulate entrepreneurial thinking

Implementing new technologies

- Integrating advanced technologies such as artificial intelligence and IoT into production processes can lead to their optimisation and the development of new agri-food solutions.
- These technologies can help streamline the supply chain and reduce waste, opening up new opportunities for entrepreneurs.

Workshops and seminars

- It is important to organise workshops and seminars that bring together industry experts and entrepreneurs to share knowledge and develop networks.
- These meetings can stimulate the exchange of ideas and identify new opportunities for collaboration and partnership.

4. Role of Government and Educational Institutions

Programme support and funding

- There is a need for government support programmes that provide access to financial resources through grants or tax incentives.

- Government could play a critical role in creating a strong foundation for start-ups by removing unnecessary barriers and providing essential resources.

Educational reforms

- Courses and curricula need to be updated to reflect current needs and trends in the agribusiness sector.
- Improving curricula to include elements of sustainability, emerging technologies and business management is essential to educate future industry leaders.

This detailed approach provides an in-depth insight into the needs and expectations of entrepreneurs in the holistic agri-food sector and highlights the importance of financial, educational and legislative support to stimulate innovation and entrepreneurship in the sector.

3. FOCUS GROUP METHOD RESEARCH

The focus group research design aimed to explore and stimulate innovation in holistic agribusiness, in line with the objectives of identifying needs and opportunities for transforming conventional businesses into holistic models and strengthening entrepreneurial thinking. The objectives included analysing ways in which researchers, students and entrepreneurs can work together to promote transformative innovation, assessing the capacity of participants to pioneer holistic innovation, and exploring the processes by which businesses can adopt holistic agricultural practices. The participants, professors and researchers from universities in Kenya, Nigeria and Togo, used role-playing games to simulate different scenarios in the holistic agribusiness sector.

In each country, the focus group sessions were facilitated by experts who guided the discussions, focusing on identifying innovations with transformative potential and fostering collaboration towards holistic innovation. The case studies, selected to illustrate specific challenges and opportunities, allowed participants to experience different roles within the holistic agri-food sector, offering innovative solutions and constructive criticism. These sessions generated valuable qualitative data that are essential for developing strategies tailored to local needs and conditions, thus promoting innovation and entrepreneurship in holistic agriculture.

3.1 Aim and objectives of the Focus Group session

Focus group research provided a detailed and participatory approach to exploring and addressing challenges in the holistic agri-food sector. Engaging a diverse group of participants, including teachers, researchers, entrepreneurs and government representatives, generated multiple perspectives and diverse solutions to stimulate entrepreneurial thinking and innovation. The role-play methodology ensured an interactive, dynamic and effective exchange of ideas, contributing to the development of practical and implementable strategies.

The objectives of the session were

- To identify specific needs, constraints and methods to stimulate entrepreneurial thinking in the context of holistic agriculture.
- To identify specific needs and constraints to stimulate innovation potential in agriculture.
- To analyse the potential for innovation through collaboration between researchers, students and entrepreneurs in holistic agriculture.
- To assess the potential of students and entrepreneurs to become innovators in holistic agriculture.
- Examine the potential for transforming traditional businesses into holistic farming practices.
- To explore how innovations in holistic agriculture can be developed into growing businesses.

The results of this research have been essential in formulating policies and initiatives to support holistic agriculture and turn innovations into successful businesses. The focus groups provided a platform for collaboration and learning between different stakeholders, thereby promoting sustainable and equitable development in the agri-food sector. The application of the conclusions and solutions generated contributed significantly to the growth and development of entrepreneurship and innovation in agriculture.

3.2 Methodology of focus group research

The focus group research plan entitled "Entrepreneurship in Holistic Agroforestry" aims to collect qualitative data from professors and researchers at universities in Kenya, Nigeria and Togo. Participants will attend individual sessions organised on a country-by-country basis, with each session comprising approximately ten people. The discussions are 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 is to explore specific needs, constraints and methods to stimulate entrepreneurial thinking and innovation potential in holistic agriculture.

This session was held at SEKU and JOOUST Universities in Kenya as part of the IULS Romania team's visit to these universities.

The discussions within the group were structured according to the SWOT analysis categories on two main components: Weaknesses and Threats (on the one hand) and Strengths and Opportunities (on the other hand). Proposals for action were requested for each of these categories.

Organisations and representatives who should participate in the focus group sessions:

1. Universities and research centres: A researcher or professor specialising in sustainable agriculture with expertise in innovative holistic farming methods.
2. Producers and farmers: An innovative farmer or farmer association leader who has already implemented or is interested in holistic practices.
3. Consumers: A representative of a consumer organisation or a consumer behaviour consultant who can provide insights into 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 agribusiness market and is interested in investing.
6. International organisations: A representative from an organisation such as FAO or the World Food Programme with experience in promoting holistic agriculture globally.
7. Church: A religious leader or representative of a church-related charitable organisation that promotes the moral values of caring for the environment and the community.
8. Cultural institution: A curator or programme director from an agricultural museum or cultural centre who can highlight the link between traditions and sustainable agriculture.
9. Banks: A loan officer or portfolio manager who specialises in agricultural finance and understands the risks and opportunities of investing in sustainable agriculture.

10. Government and regulators: An agricultural policy official or analyst who develops regulations, programmes and subsidies to support sustainable agriculture at the national level.
11. NGOs: A project or programme manager who coordinates sustainable rural development initiatives and has experience of working directly with farmers and communities.

In today's context of increasing environmental and social challenges, holistic agriculture is emerging as a key solution for agricultural sustainability. Adopting this approach requires an innovative vision and intensive collaboration between different stakeholders. The current research therefore aims to explore and harness the innovative potential of different actors in the agri-food system. The aim is to identify, analyze and stimulate innovation and entrepreneurship in holistic agriculture, involving a wide range of stakeholders, from universities to governments, and from farmers to investors, each of whom has a key role to play in shaping the future of sustainable agriculture.

1. Identify specific needs, constraints and methods for fostering entrepreneurial thinking in the context of holistic agriculture:

Universities and research institutions: Professors and researchers provide expertise in new theories and methods essential for innovation and entrepreneurial thinking.

Banks: Financial experts who can discuss ways to finance entrepreneurial initiatives in holistic agriculture.

2. Identify specific needs and constraints to increase innovation potential in agriculture:

Supply chain companies: Managers who can discuss how holistic practices can be integrated to make supply chains more efficient and sustainable.

NGOs: Direct experience with field projects can provide valuable insights into applicable innovations in holistic agricultural practices.

3. Explore the potential for innovation through collaboration between researchers, students and entrepreneurs in holistic agriculture:

Universities and research institutions: Collaborations to develop new technologies and practices.

Investors and investment funds: Discuss the economic potential of innovations and how they can be financially supported.

4. Assess the potential of students and entrepreneurs to become innovators in holistic agriculture:

Producers and farmers: Their practical experience can highlight the skills needed to innovate.

International Organizations: Global Perspective on Education and Training for Agricultural Innovators .

5. Exploring the potential for transforming traditional enterprises into holistic agricultural practices:

Church and cultural institutions: Their role in upholding sustainability values and influencing local communities to adopt holistic practices.

Government and regulatory agencies: They can provide a legal and policy framework that is conducive to the transition to holistic agriculture.

6. Explore how innovations can be developed into growing businesses in the context of holistic agriculture:

Investors and investment funds: Their role in financially supporting startups and innovative companies in holistic agriculture.

Governments and regulators: The impact of regulations and subsidies in promoting and scaling agricultural innovation.

The research highlighted the importance of a collaborative and interdisciplinary approach to fostering innovation in holistic agriculture. The diverse participation of representatives from different sectors allowed the complexity of needs and opportunities in this area to be identified and addressed.

The results underscore that through conscious and sustainable engagement, it is possible to turn current challenges into opportunities to develop agricultural practices that not only respect ecological principles, but also contribute to economic and social prosperity.

Strengthening the links between research, practice and policy can accelerate the transition to a holistic, sustainable and equitable agricultural system. This requires continued investment in the education, innovation and collaboration that are essential to sustaining and expanding the impact of holistic agriculture in society.

Moderators:

At least 1 researcher from the IULS Romania team with the following functions: coordinating the discussions towards the objectives; ensuring the involvement of all participants; time management; providing clarifications; writing the final report.

At least 2 researchers from the host university team with the following functions: ensuring the involvement of all participants; observing the non-verbal language, noting the main ideas of the participants; writing the final report.

The focus group session will be carried out in two phases: Thematic discussions and interactive workshops.

Thematic discussions

The thematic discussions will take place with the participation of all representatives.

The time allocated to each objective will be approximately 15 minutes.

For each objective, the responses of the participants have been solicited and the rapporteur (a researcher moderator from the host university team) will note down the responses of each participant in the form of keywords (Annex 2). The table will be designed and filled in during the discussions, to be corrected and completed in real time.

The questions for each objective:

Objective 1. Identify specific needs, constraints and methods to stimulate entrepreneurial thinking.

What do you consider to be the main cultural, economic or educational barriers to the development of entrepreneurial mindsets in your community? How do they affect the initiative and capacity to create new agri-food enterprises?

What resources do you think could be mobilised and what opportunities could be exploited to support the development of entrepreneurial thinking? How could these resources be used to create a more favourable environment for entrepreneurial initiative?

Objective 2. Identify specific needs, constraints and methods to stimulate innovation potential

What do you consider to be the main cultural, economic or technological barriers to innovation in the agri-food sector in your municipality? How do these barriers affect the ability of local people to adopt or develop new agricultural technologies and practices?

What existing resources in your community could be used to support and stimulate agri-food innovation? What untapped opportunities do you think could be used to foster an innovative environment in the sector?

Objective 3. analyse the potential for creating innovation triangles between researchers, students and entrepreneurs in holistic agriculture

In your experience, what elements facilitate or, conversely, hinder effective collaboration between researchers, students and entrepreneurs in developing innovations for a holistic agri-food sector? How could these interactions be improved to maximise 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 the synergy between research, practice and entrepreneurship can be strengthened?

Objective 4.To analyse the potential of agricultural students and entrepreneurs to become innovators in holistic agriculture.

What are the main skills of students and entrepreneurs in your community that could help them to contribute to innovation in holistic agriculture? What are the gaps and how could these be addressed?

What motivational factors do you think would encourage students and entrepreneurs to participate more actively in holistic agriculture innovation processes? What are the main barriers they face?

Objective 5. analyse the potential for business transformation in holistic agriculture

What examples of innovation in holistic agriculture have had a significant impact on local business transformation? How have these changes been perceived by the community and the market?

What opportunities do you see for scaling up and expanding innovative holistic agriculture practices? What are the main markets or sectors that could benefit most from these innovations?

Objective 6. Potential of innovations to generate growing businesses

How have specific innovations in holistic agriculture contributed to business growth and development in your community?Do you have concrete examples of success that could be replicated?

What factors do you think are essential for turning an innovation in holistic agriculture into a successful commercial business?How can funding, market and regulatory challenges be addressed?

Interactive workshops

The thematic discussions will be organised in 3 teams:

Team 1: Innovation and policy:
- Government or regulatory representatives
- Representatives from universities or research institutions
- NGO representative
- Bank representative

Team 2: Implementation and Market Impact
- Producer and farmer representative
- Purchasing or logistics manager from agri-food company
- Representative from international organisations
- Investor or investment fund

Team 3: Community and culture
- Religious leader or charity representative
- Consumer representative
- Representative of cultural institutions

The time allotted for each objective is approximately 15 minutes.
Participants will be asked to respond to each objective.
Each team will have a rapporteur (a researcher moderator from the host university / IULS team) who will note down each participant's answers in the form of keywords and conclusions.

The questions for each objective for the interactive workshops will be

Objective 1. Identify specific needs, constraints and methods to stimulate entrepreneurial thinking.

Based on the constraints and opportunities identified, what specific actions do you propose to improve and stimulate entrepreneurial thinking in agriculture? What concrete steps should be taken to turn these ideas into effective practices?

Objective 2. Identify specific needs, constraints and methods to stimulate innovation potential

Given the constraints and resources discussed, what specific actions do you recommend to improve and stimulate innovation potential in Community agriculture? What concrete steps should be taken to transform these resources and opportunities into solutions to stimulate innovation potential?

Objective 3. analyse the potential for creating innovation triangles between researchers, students and entrepreneurs in holistic agriculture

Given the current dynamics between researchers, students and entrepreneurs, what concrete strategies do you propose to strengthen this network and stimulate a continuous flow of innovation? What specific roles should each group play in order to optimise collaboration and results?

Objective 4.Analyse the potential of agricultural students and entrepreneurs to become innovators in holistic agriculture.

What concrete initiatives or programmes do you propose to support and encourage students and entrepreneurs to become innovation leaders in holistic agriculture? How could academic institutions, business and government work together to achieve this goal?

Objective 5. Analyse the potential for business transformation in holistic agriculture

What strategies do you consider essential to facilitate the transformation of traditional agribusinesses into innovative and sustainable entities? What role should different economic and institutional actors play in this process?

Objective 6. The potential for transforming innovations 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-sectoral collaboration and government support play in this process?

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 need to be taken into account:

Venue: Reserve suitable spaces at SEKU and JOOUST, arranged to facilitate group discussions, preferably with round or U-shaped tables to encourage interaction. Technical Equipment: insurance projectors and screens, audio recording devices. Name tags: for easy identification of participants and to facilitate communication. Invitations and confirmations: Sending out invitations (model in annex to this document) in good time and following up on confirmations of participation.

3.3 Focus Group results and discussions

In an attempt to assess 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.

Level of participation and engagement

The active participation and commitment of members was high, reflecting the effective selection of participants in 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.

In-depth knowledge and relevance

The discussions were characterised by a high level of 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.

Scenarios approach

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

Creative solutions

Discussions on the development of student business incubators highlight the innovative thinking and forward thinking required to transform the academic and entrepreneurial environment.

Concrete proposals: The emphasis on the role of the state in supporting innovation and entrepreneurship points to a clear direction for future action, potentially applicable to public policy.

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.

Improving the sessions

Positive feedback on the group structure and methodology suggests that the role-play format is effective, but clarity of roles and objectives could be improved to maximise the benefits of this format.

Impact of the format

The case study approach generated information on concrete actions and processes, avoiding the pitfall of generic statements, which is essential for action-oriented and applicable results in development projects.

The analysis of the focus group participants' responses highlighted several key aspects that contribute to the understanding and potential for innovation and transformation in holistic agribusiness innovation and transformation at partner HEIs. Based on the data collected and the interactions recorded, the following sections will detail how the contributions of different categories of participants informed the discussions and guided the conclusions.

1. Encouraging entrepreneurial thinking by identifying needs and constraints

The discussions revealed that the main barriers to the development of entrepreneurial mindsets are cultural, economic and educational. Participants stressed the need for educational programmes to integrate entrepreneurship and innovation courses into the university curriculum. For example, a professor from a research institution emphasised the importance of project-based learning, which encourages students to develop innovative solutions to real problems. Farmers and entrepreneurs highlighted lack of access to finance and markets as a major constraint and suggested that educational institutions should facilitate closer links with industry.

2. Improvement of innovation potential

Cultural and technological barriers were given particular attention, with participants discussing how traditions can inhibit or stimulate the adoption of innovations. Representatives from international organizations discussed global programs that have successfully integrated new technologies into traditional agricultural practices, demonstrating that transformation is possible. The need for consistent support from governments to provide the necessary infrastructure for innovation was also highlighted.

3. Innovation creation through triadic collaboration

Collaboration between researchers, students and entrepreneurs was seen as essential. Discussions highlighted the importance of creating innovation networks where ideas can be tested and developed in a controlled environment. One concrete example was a partnership between a university and a local agribusiness, which allowed students to apply theoretical knowledge directly in a practical setting, generating innovative solutions that were subsequently implemented on a large scale.

4. Transforming traditional businesses

The ability of existing farms to adopt holistic practices was discussed. It was noted that many agricultural businesses are reluctant to take the risks associated with changing traditional practices. However, successful examples presented by representatives of cultural institutions demonstrated the long-term benefits of adopting such business models. For example, a local company that adopted holistic techniques was able to increase its profitability and reduce its environmental impact.

5. Scaling innovation into viable businesses

The final part of the discussion focused on how to scale up innovations and turn them into successful businesses. The need for financing mechanisms tailored to the needs of innovative start-ups was identified as a key factor. The importance of creating public-private partnerships to support sustainable innovations that can be widely adopted was also highlighted.

The focus groups provided valuable insights into how different entities can work together to promote innovation and entrepreneurship in holistic agriculture. The results suggest that an integrated approach, including educational, financial and institutional support, can facilitate the transformation of traditional agricultural enterprises into innovative holistic models. This process will not only benefit from increased sustainability, but will also contribute to the formation of a new generation of entrepreneurs ready to respond to the complex challenges of the modern world. This analysis highlights the need for continued collaboration between all stakeholders to ensure that innovation in holistic agriculture becomes the norm, not the exception.

4. Conclusions

Global society is increasingly aware of the need for sustainable practices, and the holistic agri-food sector sits at the intersection of innovation and tradition, playing an important role in shaping a sustainable future. It offers a unique opportunity for entrepreneurs to make a significant contribution to the green economy by adopting and promoting innovative farming and production methods.

In the context of this dynamic, the focus groups organised were mainly aimed at exploring the perceptions and experiences of entrepreneurs in this sector, and to gather valuable data reflecting the needs, constraints and methods to stimulate entrepreneurial thinking and innovation. By analysing these responses in detail, the study aims to identify the most effective strategies to support and stimulate sustainable development in holistic agriculture.

1. The responses indicate a clear need for tailored training programmes and easy access to financial resources, which are essential to cultivate an entrepreneurial mindset in the holistic agri-food sector.

Mentoring and workshops are also recognised as important tools to support emerging entrepreneurs. It is therefore crucial to develop a support infrastructure that addresses these complex needs and fosters a robust entrepreneurial mindset.

2. Identifying specific needs and constraints to enhance innovation potential in agriculture More attention needs to be paid to technological and regulatory barriers to facilitate innovation.

Participants suggest that simplifying regulations and improving access to modern technologies can accelerate the uptake of innovation. Close cooperation between educational institutions, government and the private sector is therefore essential to remove these barriers and create an enabling environment for innovation.

3. Analysing the potential for innovation through collaboration between researchers, students and entrepreneurs in holistic agriculture Interaction between researchers, students and entrepreneurs is fundamental to generating innovative and applicable solutions. Close cooperation and joint projects are necessary to maximise the impact of innovations. Creating effective networks and supporting interdisciplinary initiatives can transform the agricultural sector by providing sustainable solutions to current problems.

4. Assessing the potential of students and entrepreneurs to become holistic agricultural innovators Hands-on training and access to development resources are essential to prepare tomorrow's leaders in holistic agricultural innovation.

Responses suggest that integrating courses focused on sustainability and emerging technologies into academic curricula can improve the capacity of students and entrepreneurs to innovate. As such, educational institutions have a key role to play in shaping a sustainable future.

5. There is a clear consensus that innovations in holistic agriculture can revitalise traditional businesses, bringing significant economic and environmental benefits. Transforming these businesses requires a strategic approach, including educating entrepreneurs about the benefits of sustainable practices and providing ongoing support to implement them.

6. Exploring how innovations in holistic agriculture can develop into growing businesses Innovations in holistic agriculture have significant potential to develop into thriving businesses, contributing to a green and sustainable economy. Support for scaling up these innovations, including adequate funding and strategic partnerships, can accelerate their commercial growth.

It is essential that governments and investors recognise and support these opportunities to ensure long-term success.

Analysis of the focus group responses reveals a complex landscape of challenges and opportunities in the holistic agri-food sector. As entrepreneurs navigate regulatory, cultural and technological constraints, it is essential to develop a robust infrastructure that facilitates innovation and provides the necessary support to turn innovative ideas into sustainable and profitable practices.

The recommendations that emerged from the discussions provide a clear direction for future policies and strategies that can improve access to resources, education and cross-sector collaboration. In doing so, this research contributes to the development of a strategic framework to support entrepreneurship in holistic agriculture, which is essential for a greener and more prosperous future.

Appendix

Appendix 1

Offline Questionnaire Form Example

Hello,

Thank you for taking the time to participate in this survey. Your contribution is very important to the "Cooperation for Holistic Agriculture Innovation Nests in Sub-Saharan Africa" project. This survey aims to identify specific needs, constraints, and methods to enhance entrepreneurial thinking within the holistic agri-food context. Holistic agri-food practices involve taking responsibility for their impacts on the natural, social, economic, and cultural environments. Please answer honestly and in detail to help us support growth and innovation in this vital sector.

Your responses are extremely valuable to our efforts. Please take care in answering the questions and help us gain a comprehensive understanding of the situation.

Thank you once again for your participation.

Best regards,

The Research Team

I. Identification of Needs, Constraints, and Methods for Stimulating Entrepreneurial Thinking

Explore the main forces and challenges shaping entrepreneurial thinking in the holistic agri-food field and contribute to creating solutions tailored to your needs.

1. What do you consider the most important factors and main challenges that stimulate entrepreneurial thinking in the holistic agri-food field? Please select up to three options and add any other challenges you encounter.
    - Access to financing and financial resources
    - Education and training in entrepreneurial skills specialized in holistic agri-food
    - Access to mentorship and advice from field experts
    - Development of support networks among entrepreneurs in the holistic agri-food field
    - 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 holistic agri-food
- Lack/scarcity of human resources
- Difficulties in accessing markets for innovative agri-food products
- Others: _____

3. What methods do you consider most effective in stimulating entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options)
   - Organizing mentorship programs and internships in companies within the holistic agri-food industry
   - Facilitating access to financing and startup resources for entrepreneurs in the holistic agri-food field
   - Developing educational and training programs in entrepreneurship tailored specifically to the holistic agri-food field
   - Creating hubs and innovation centers in holistic agri-food to stimulate collaboration and innovation
   - Others: _____

4. What do you think the government or educational institutions should do to stimulate entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options)
   - Implementing educational programs in entrepreneurship specialized in holistic agri-food in schools and universities, focusing on developing skills in critical thinking, innovation, and business management.
   - Developing mentorship programs and business incubators specialized in holistic agri-food that 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.
   - Implementing support programs for innovation and startups in holistic agri-food through grants, tax facilities, and access to research infrastructure and resources.
   - Others: _____

5. Please imagine you are involved in a startup project in the holistic agri-food field. What strategies or initiatives would you implement to stimulate entrepreneurial thinking in your team and to overcome potential obstacles encountered?

II. Identification of Pathways to Stimulate Innovation Potential

We invite you to share your experiences related to obstacles to innovation and propose initiatives that could accelerate transformation in the agri-food sector.

6. What do you think are the main obstacles to innovation in holistic agri-food? (Select up to 3 options)
    - Regulatory conditions and excessive bureaucracy
    - Lack of access to financing and financial resources
    - Resistance to change within organizations and communities
    - Difficulties in establishing effective partnerships and collaborations
    - Others (please specify): _____

7. Please imagine you are involved in a research or entrepreneurship project in holistic agri-food. What solutions or initiatives do you think could be implemented to stimulate innovation, and how would you develop this project to maximize its innovation potential and impact in 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 organizations, government, and NGOs
    - Others: _____

III. Collaboration in Holistic Agri-Food Innovation

This section aims to understand and improve collaboration among different stakeholders to maximize the impact of agri-food innovations.

8. Which of the following do you consider could be the main benefits of collaboration among 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: _____

9. What are the main obstacles or constraints encountered in collaboration among researchers, students, and entrepreneurs for innovation in holistic agri-food? (Select up to 3 options)
   - Lack of communication and cooperation among different stakeholders
   - Differences in objectives and priorities among researchers, students, and entrepreneurs
   - Lack of financial resources for collaborative innovation initiatives
   - Language or cultural barriers in communication and mutual understanding
   - Others: _____

10. How do you think these obstacles could be overcome to facilitate collaboration and innovation in holistic agri-food? (Open response)

IV. Identification of Needs and Motivations for Innovation

Help us better understand how education and training in innovation can support the emergence of new leaders in holistic agri-food.

11. To what extent do you consider education and training in innovation important for students and entrepreneurs in the holistic agri-food field? Please rate the effect on a scale from 1 to 5. (1 - not important at all, 2 - unimportant, 3 - neutral, 4 - important, 5 - very important)

    1 2 3 4 5

12. What are the main obstacles or constraints that students and entrepreneurs in agriculture face in becoming innovators in holistic agri-food? (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 field
    - Lack of knowledge and expertise in innovation and innovation management
    - Resistance to change and conservative mindset in the traditional agricultural environment
    - Others: _____

13. How do you think these obstacles should be addressed to support students and entrepreneurs in the innovation process in holistic agri-food? (Open response)

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14. Imagine you are a student passionate about agriculture and you want to develop an innovative business in the holistic agri-food sector. What steps would you take to turn your idea into reality and overcome potential obstacles? (Choose the first 3 most important steps)
    - Researching and deeply learning the concepts and practices of holistic agri-food.
    - Developing a detailed business plan that includes objectives, implementation strategies, and financial projections.
    - Identifying and hiring a mentor or a consultant with experience in holistic agri-food to receive guidance and support in the business development process.
    - 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 startup grants or loans for young entrepreneurs.
    - Others: _____

V. Identification of Needs and Opportunities for Transforming Conventional Businesses into Holistic Agri-Food Businesses

Express your vision of how traditional businesses can be transformed to meet the demands of sustainability and innovation in agri-food.

15. Which of the following do you consider the main opportunities for transforming businesses into holistic agri-food? (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: _____

16. To what extent do you consider the transformation of businesses into holistic agri-food can contribute to increasing their competitiveness and sustainability? Please rate the

effect on a scale from 1 to 5. (1 - no effect, 2 - reduced effect, 3 - medium effect, 4 - significant effect, 5 - major effect)

1 2 3 4 5

17. What are the main obstacles or constraints that businesses encounter in the process of transforming into holistic agri-food? (Select up to 3 options)
    - o High costs associated with implementing sustainable agricultural practices and certifying organic products
    - o Lack of access to financial resources and investments for modernizing infrastructure and agricultural technologies
    - o Resistance to change and lack of expertise in holistic agri-food
    - o Legislative and regulatory barriers to adopting ecological practices and quality standards
    - o Others: _____

18. How do you think these obstacles can be overcome to facilitate the process of transforming businesses into holistic agri-food? (Open response)

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19. Imagine you are an agricultural entrepreneur who wishes to transform your traditional business into one focused on holistic agri-food. What would be the first steps you would take and what resources or support would you seek to achieve this? (Choose the first 3 most important steps)
    - o Assessing the current state of the business to identify strengths and areas needing improvement for the transition to holistic agri-food.
    - o Researching and hiring a consultant or an expert in holistic agri-food to provide guidance and assistance in the transition process.
    - o Identifying and participating in training programs and seminars in the field of holistic agri-food.
    - o Developing a business plan that includes clear objectives, marketing strategies, and financial projections.
    - o Identifying potential sources of funding, such as government grants or loans for agricultural businesses.
    - o Establishing partnerships with local suppliers and community organizations to support the procurement and marketing of holistic agri-food products.
    - o 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 holistic agri-food.

- Others: _____

VI. Identification of Innovations with Transformation Potential

Let's discuss promising innovations in holistic agri-food and how they can evolve into successful businesses contributing to a more dynamic and adaptable sector.

20. Which of the following do you consider the most promising innovations with potential to transform into growing businesses in holistic agri-food? (Select up to 3 options)
    - Use of blockchain technologies for tracking supply chains and authenticating organic food products
    - Development of alternative foods such as vegetable burgers or plant-based meat substitutes
    - Implementation of urban agriculture systems and local food production in cities
    - Use of artificial intelligence and robots in agricultural processes to optimize yield and reduce costs
    - Others: _____

21. What are the main obstacles or constraints that innovations encounter in transforming into successful businesses in holistic agri-food? (Select up to 3 options)
    - Lack of investment capital and financing for developing and scaling innovations
    - Regulatory and bureaucratic barrier to introducing innovations into the market
    - Consumer or traditional producer resistance to adopting new technologies or products
    - The need to educate and inform the market about the benefits of innovations
    - Others: _____

22. Imagine you are involved in the development of an innovation in holistic agri-food, such as a new technology for processing organic foods. What strategies and tactics would you implement to ensure 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 infrastructure and capacities to meet increasing demand
    - Implementing a training and education program to promote the use of technology

- Others: _____

Final Questions: Profile

This last part is essential to ensure that our data analysis reflects the diverse perspectives and experiences of participants in this study.

a. What is the primary business activity of your enterprise?
- Agricultural production (cereals and other field crops, livestock, poultry, bees, aquaculture, vegetables, fruits, etc.)
- Agricultural product processing - milk, meat, vegetable, and fruit processing workshops and factories.
- Trade and other services (stores, restaurants, inns, etc.)
- Other: _____

b. How long have you been operating this business? (years)

_____

c. What was the turnover in 2023 (in dollars)?

_____

d. What is your gender? (Please check the appropriate response or fill in the blank if the options presented do not reflect your gender identity.)
- Female
- Male
- Prefer not to answer
- Other (please specify): _____

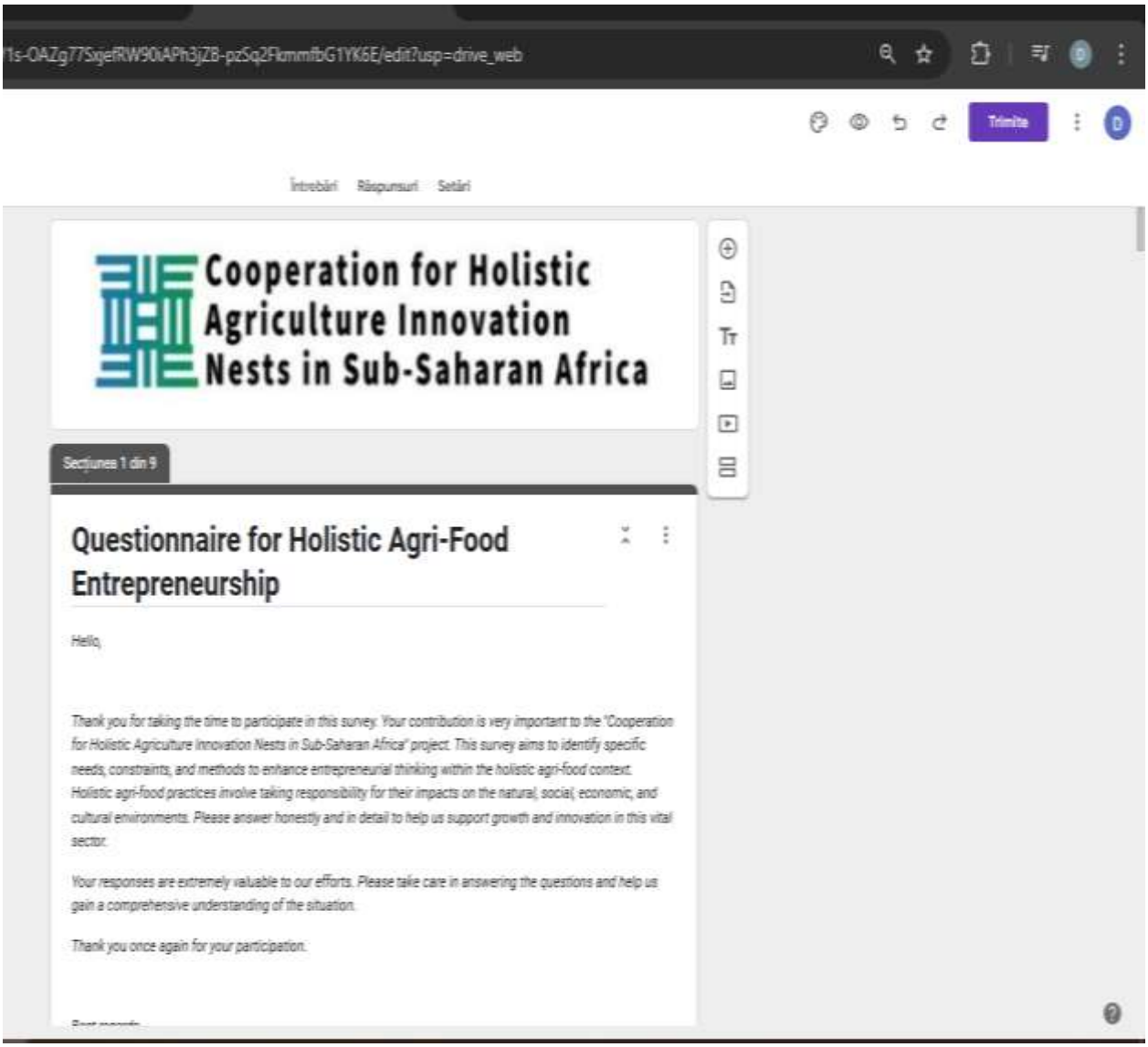
e. Please specify your age. This information will help us better understand the impact of experience in relation to the themes of this questionnaire. Your age: _____ (years)

f. What is the highest level of education you have completed? (Select no more than 1 option)
- Primary
- Secondary
- University
- Postgraduate
- Other (please specify): _____

Thank you for your contribution to this study. Your opinion is crucial for understanding the potential for innovation and growth in the holistic agri-food sector.

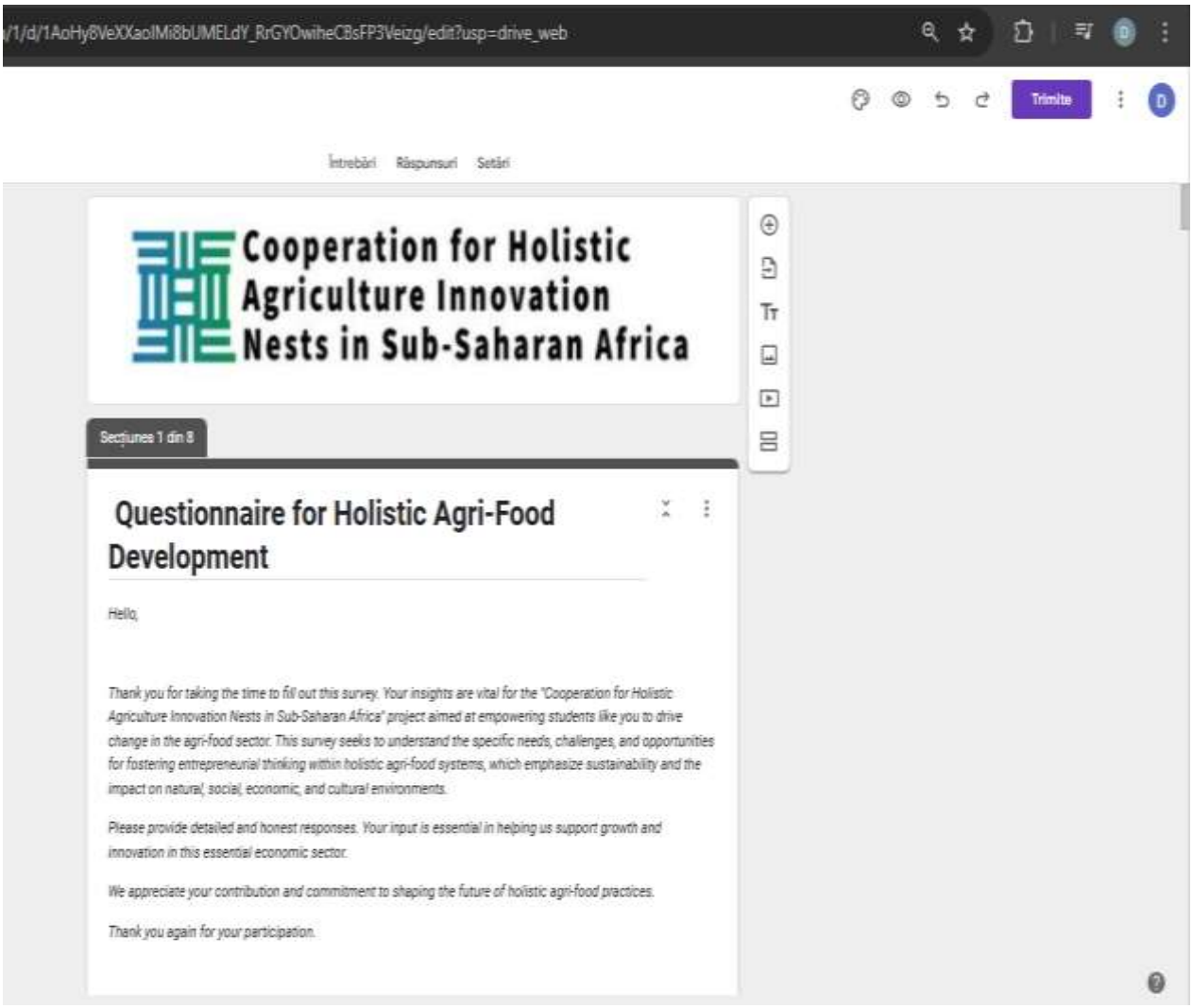
Appendix 2

Sample online questionnaire for entrepreneurs



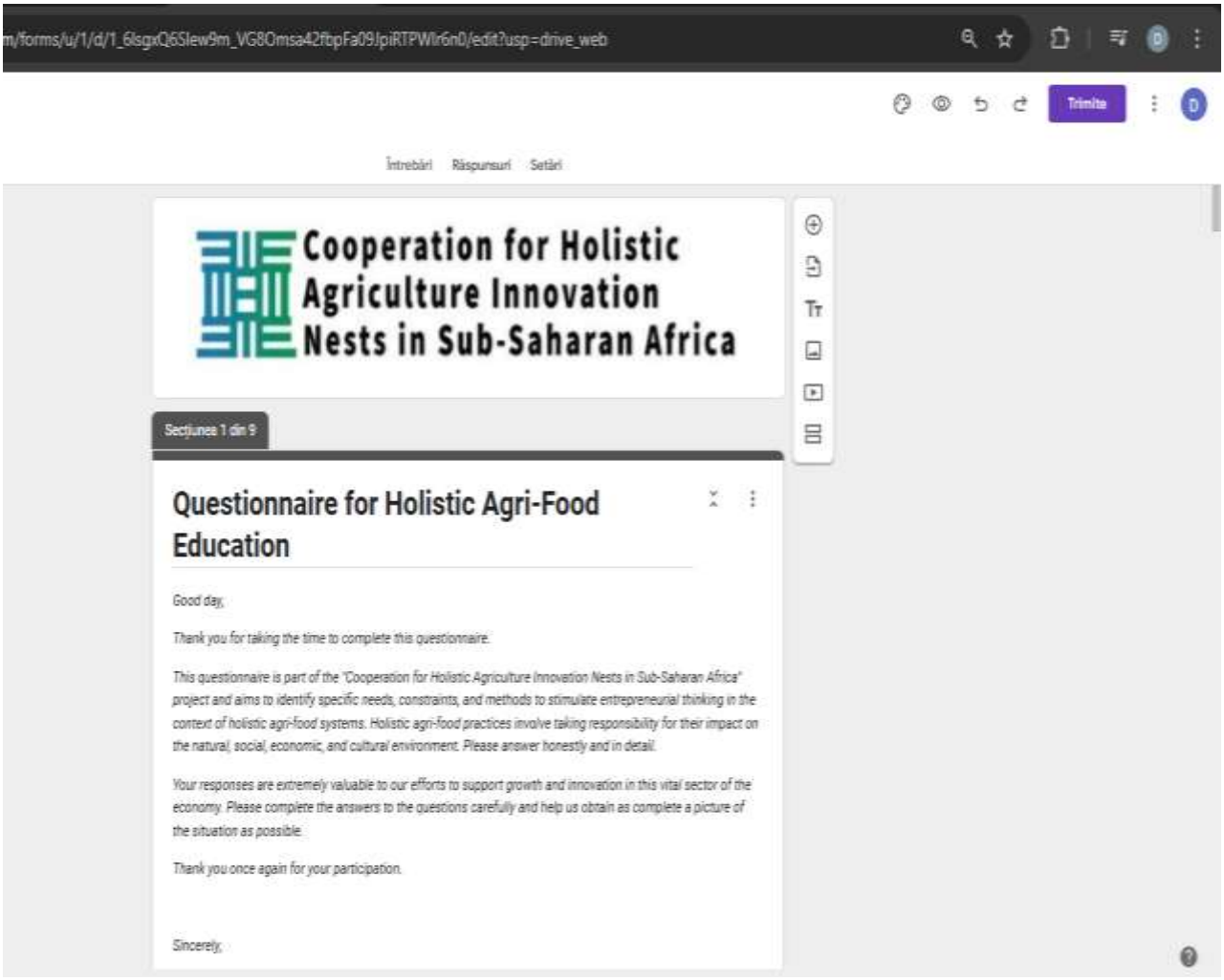
Appendix 3

Sample online questionnaire for students



Appendix 4

Sample online questionnaire for teachers and researchers



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I. Identification of Needs, Constraints, and Methods for Stimulating Entrepreneurial Thinking

Explore the main forces and challenges shaping entrepreneurial thinking in the holistic agri-food field and contribute to creating solutions tailored to your needs.

1. What do you consider the most important factors and main challenges that stimulate entrepreneurial thinking in the holistic agri-food field? Please select up to three options and add any other challenges you encounter. *

- [ ] Access to financing and financial resources
- [ ] Education and training in entrepreneurial skills specialized in holistic agri-food
- [ ] Access to mentorship and advice from field experts
- [ ] Development of support networks among entrepreneurs in the holistic agri-food field
- [ ] Altele: _____

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 holistic agri-food
- [ ] Lack/scarcity of human resources
- [ ] Difficulties in accessing markets for innovative agri-food products
- [ ] Altele: _____

3. What methods do you consider most effective in stimulating entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options) *

- [ ] Organizing mentorship programs and internships in companies within the holistic agri-food industry
- [ ] Facilitating access to financing and startup resources for entrepreneurs in the holistic agri-food field
- [ ] Developing educational and training programs in entrepreneurship tailored specifically to the holistic agri-food field
- [ ] Creating hubs and innovation centers in holistic agri-food to stimulate collaboration and innovation
- [ ] Altele: _____

4. What do you think the government or educational institutions should do to stimulate entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options) *

- [ ] Implementing educational programs in entrepreneurship specialized in holistic agri-food in schools and universities, focusing on developing skills in critical thinking, innovation, and business management.
- [ ] Developing mentorship programs and business incubators specialized in holistic agri-food that 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.
- [ ] Implementing support programs for innovation and startups in holistic agri-food through grants, tax facilities, and access to research infrastructure and resources.

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6. What do you think are the main obstacles to innovation in holistic agri-food? (Select up to 3 options) *

- [ ] Regulatory conditions and excessive bureaucracy
- [ ] Lack of access to financing and financial resources
- [ ] Resistance to change within organizations and communities
- [ ] Difficulties in establishing effective partnerships and collaborations
- [ ] Altele: _____

7. Please imagine you are involved in a research or entrepreneurship project in holistic agri-food. What solutions or initiatives do you think could be implemented to stimulate innovation, and how would you develop this project to maximize its innovation potential and impact in 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 organizations, government, and NGOs
- [ ] Altele: _____

Înapoi Înainte Golește formularul

Nu trimiteți parole prin formularele Google.

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8. Which of the following do you consider could be the main benefits of collaboration among 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
- [ ] Altele: _____

9. What are the main obstacles or constraints encountered in collaboration among researchers, students, and entrepreneurs for innovation in holistic agri-food? (Select up to 3 options) *

- [ ] Lack of communication and cooperation among different stakeholders
- [ ] Differences in objectives and priorities among researchers, students, and entrepreneurs
- [ ] Lack of financial resources for collaborative innovation initiatives
- [ ] Language or cultural barriers in communication and mutual understanding
- [ ] Altele: _____

10. How do you think these obstacles could be overcome to facilitate collaboration and innovation in holistic agri-food? (Open response) *

Răspunsul tău

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: .....

Appendix 6

Sample matrix for Focus Group sessions

Participants	Objectives					
	1	2	3	4	5	6
Universities and research institutions						
Producers and farmers						
Consumer representatives						
Companies in the agri-food supply chain						
Investors and investment funds						
International organizations						
Church						
Cultural institutions						
Banks						
Government						
NGOs						

RAPPORT DE RECHERCHE

D1.7 - Rapport d'analyse du potentiel d'innovation et de transformation de l'AH dans les EES partenaires

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

Contenu

1. PLAN GÉNÉRAL DE RECHERCHE

En tant que secteur vital, l'agriculture a mis en évidence l'importance d'adopter des approches innovantes, telles que des approches holistiques qui intègrent des pratiques durables et favorisent un équilibre entre l'efficacité environnementale et la responsabilité sociale.

L'analyse a exploré le potentiel d'innovation et de transformation de l'agroalimentaire holistique dans les universités partenaires. En examinant les attitudes antérieures à l'égard de l'apprentissage holistique, l'utilisation de différentes méthodologies et l'accès aux possibilités de formation, la recherche visait à fournir des recommandations détaillées pour améliorer les pratiques d'enseignement et l'impact de l'enseignement holistique de l'agro-industrie dans les institutions partenaires.

Dans le contexte de la mondialisation, il est devenu essentiel d'approfondir la dynamique d'innovation dans les établissements d'enseignement supérieur.

1.1 Buts et objectifs de la recherche

La recherche menée dans le cadre de ce rapport visait à analyser le potentiel d'innovation et de transformation des pratiques agro-industrielles holistiques dans les universités partenaires. Elle s'est attachée à évaluer la manière dont les méthodes pédagogiques utilisées stimulent l'innovation et la transformation dans le secteur agricole.

En explorant les perceptions des entrepreneurs, des enseignants et des étudiants sur l'innovation dans l'enseignement et l'apprentissage de l'agriculture holistique, l'étude a exploré différentes approches pédagogiques et identifié les possibilités d'améliorer la formation des enseignants dans ce domaine.

La recherche a utilisé des méthodes mixtes, y compris des analyses documentaires et des questionnaires en ligne, complétés par des sessions de groupes de discussion avec des enseignants, des étudiants et des représentants d'entreprises. L'objectif n'était pas seulement d'identifier les innovations actuelles en matière d'enseignement agricole holistique, mais aussi de fournir des recommandations stratégiques pour l'intégration de ces pratiques innovantes et efficaces dans le programme d'études.

L'objectif était de promouvoir des pratiques d'enseignement durables et de faciliter l'adaptation à un environnement universitaire et agro-industriel en pleine évolution. Le plan de recherche comprenait trois objectifs principaux, adaptés aux spécificités de chaque institution partenaire, avec un accent particulier sur l'identification et l'application des méthodes pédagogiques les plus efficaces pour soutenir l'innovation et la transformation dans l'agriculture holistique.

1.2 Plan méthodologique

La nécessité de mettre à jour les informations sur la façon dont les approches innovantes de l'enseignement agricole holistique peuvent transformer l'enseignement supérieur a motivé cette entreprise. En utilisant des méthodes de recherche de pointe, notamment des questionnaires en ligne et des sessions de groupes de discussion, l'étude visait à analyser les points de vue des universitaires, des étudiants et de la communauté des affaires sur l'adoption de l'innovation et des pratiques agricoles holistiques.

L'objectif principal était d'identifier les défis, les opportunités et les besoins spécifiques de ces groupes, facilitant ainsi l'élaboration de recommandations pour la formation des enseignants à l'innovation agricole holistique. Grâce à la collecte et à l'analyse de données, la recherche visait à développer un ensemble de compétences de base et de stratégies adaptées aux besoins éducatifs du secteur de l'agriculture holistique, contribuant ainsi au renforcement d'un environnement éducatif innovant et durable dans les établissements d'enseignement supérieur.

Cette approche, qui intègre l'analyse des besoins éducatifs et l'identification des compétences requises, vise à développer des stratégies adaptées à chaque institution partenaire. Cette recherche vise à améliorer continuellement les pratiques d'enseignement et à favoriser un environnement d'apprentissage robuste, innovant et adaptable dans l'enseignement supérieur.

Nous avons adressé le questionnaire en ligne aux mêmes groupes, non seulement pour compléter et vérifier les données des entretiens, mais aussi pour identifier les besoins spécifiques en matière de soutien à l'innovation et à l'agriculture holistique. Le questionnaire avait les objectifs suivants : a) Identifier les besoins spécifiques de soutien en matière d'innovation et d'agriculture holistique parmi les entrepreneurs. b. Pour les enseignants, identifier les lacunes dans les compétences nécessaires pour enseigner efficacement les concepts de l'agriculture holistique. c. Pour les étudiants, identifier les compétences essentielles et les obstacles à l'accès à l'innovation et à l'agriculture holistique. Nous avons produit des rapports de synthèse à partir des résultats afin de guider le développement des programmes de formation.

Les sessions de groupes de discussion ont renforcé les résultats des entretiens et des questionnaires par des discussions approfondies avec des membres de la communauté universitaire et entrepreneuriale, explorant les liens entre l'environnement éducatif innovant et les compétences requises, en mettant l'accent sur les compétences essentielles à l'innovation dans l'enseignement agricole holistique.

1.3 Résultats et discussions

Selon les résultats des questionnaires et des groupes de discussion, l'interdisciplinarité est cruciale dans la formation à l'entrepreneuriat pour une agriculture holistique. Cela souligne la nécessité d'une flexibilité et d'une coopération entre les différentes disciplines académiques afin de répondre efficacement aux problèmes uniques rencontrés par l'industrie agricole.

Outre sa capacité à produire des solutions créatives, l'interdisciplinarité est saluée pour sa contribution au développement de la pensée critique et de l'adaptabilité, deux capacités transversales essentielles à la réussite continue des enseignants et des élèves. Le rapport souligne également le rôle essentiel que joue l'innovation dans le programme complet d'enseignement de l'agriculture et le besoin pressant pour les éducateurs d'adopter des approches d'enseignement créatives et flexibles. Afin de résoudre les problèmes et de maximiser les perspectives du secteur de l'enseignement agricole, les éducateurs et les entrepreneurs de l'éducation sont invités à étudier et à mettre en pratique les méthodes de pointe qui ont le potentiel de révolutionner le domaine.

L'étude s'est intéressée de près à la manière dont les différentes approches pédagogiques influencent la créativité et la pensée entrepreneuriale des étudiants et des enseignants. La dynamique des interactions et le retour d'information obtenu tout au long des sessions d'apprentissage montrent comment la flexibilité et le niveau des conversations peuvent avoir un impact direct sur la production d'idées créatives qui peuvent être utilisées pour améliorer les méthodes d'enseignement au fil du temps.

Ces résultats, qui proviennent d'une variété d'approches d'étude, montrent à quel point les éléments qui soutiennent la croissance professionnelle et entrepreneuriale dans l'enseignement supérieur agricole sont complexes et interconnectés. Ils attirent l'attention sur la nécessité d'une approche globale et intégrée de la recherche et de l'enseignement, démontrant comment différents points de vue peuvent faire progresser notre connaissance des besoins éducatifs et aider à trouver des solutions pratiques à long terme qui favoriseront l'innovation dans l'enseignement agricole.

L'examen des résultats des questionnaires et des groupes de discussion permet de comprendre en profondeur l'efficacité des stratégies d'enseignement utilisées dans les universités partenaires, ce qui met en évidence la valeur de la flexibilité et de la créativité dans la résolution des problèmes complexes de l'agriculture holistique. Chaque méthodologie de recherche a mis en lumière les différentes facettes des exigences et des possibilités de créativité chez les éducateurs, en soulignant comment une approche intégrée peut transformer les environnements d'apprentissage et favoriser la pensée créative propre à l'agriculture holistique.

2. LA RECHERCHE PAR LA MÉTHODE DU QUESTIONNAIRE

Les résultats des questionnaires ont révélé que malgré l'intérêt croissant pour l'adoption de pratiques agricoles holistiques, les enseignants et les agriculteurs sont confrontés à de nombreux défis, tels que le manque de ressources adéquates et les connaissances limitées en matière de technologies durables. Cela souligne la nécessité de développer des programmes de formation et des ateliers pour améliorer les compétences en matière d'innovation et de gestion de la durabilité.

En outre, la collaboration interdisciplinaire entre les universités et l'industrie agroalimentaire a été identifiée comme un catalyseur nécessaire pour accélérer l'adoption des innovations. L'intégration de l'expérience pratique à la recherche universitaire peut générer des solutions adaptatives qui répondent efficacement aux besoins d'un secteur agricole dynamique, tout en favorisant une transition en douceur vers des pratiques agricoles plus holistiques et plus responsables.

2.1 But et objectifs du questionnaire

Les objectifs de la recherche par questionnaire découlent des objectifs du projet et sont les suivants :

I. Identifier les besoins, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale
II. identifier les moyens de stimuler le potentiel d'innovation
III. Collaboration en matière d'innovation agroalimentaire holistique
IV. Identifier les besoins et les motivations en matière d'innovation
V. Identifier les besoins et les possibilités de transformer les entreprises conventionnelles en entreprises agroalimentaires holistiques
VI. Identification des innovations ayant un potentiel de transformation

L'identification des besoins, des contraintes et des méthodes pour stimuler la pensée entrepreneuriale est une tâche cruciale. Cet objectif vise à explorer et à mesurer les facteurs qui influencent la capacité de réflexion entrepreneuriale au sein de la communauté universitaire et des parties prenantes du secteur agroalimentaire. Le but est d'identifier les principaux obstacles et les exigences éducatives auxquelles il faut prêter attention pour cultiver et renforcer de fortes capacités entrepreneuriales.

L'identification des moyens de stimuler le potentiel d'innovation est au cœur de cet objectif, qui vise à découvrir et à évaluer les méthodes et les pratiques susceptibles d'améliorer l'innovation dans les établissements d'enseignement et les entreprises agroalimentaires. L'enquête se concentrera sur l'optimisation du potentiel d'innovation par l'utilisation de technologies émergentes, de politiques de soutien et de collaborations intersectorielles.

Collaboration en matière d'innovation agroalimentaire holistique : L'objectif est d'identifier et de développer des partenariats stratégiques entre le monde universitaire, l'industrie et d'autres entités pertinentes qui peuvent contribuer à l'innovation dans le secteur agroalimentaire. Le but est de créer un réseau de collaboration qui facilite l'échange des connaissances et des ressources nécessaires à l'innovation holistique.

Identifier les besoins et les motivations pour l'innovation : cet objectif vise à comprendre ce qui motive les individus et les organisations à adopter des innovations et à participer à des processus de transformation. Il s'agira d'étudier comment des facteurs tels que la législation, les incitations financières et la pression sociale influencent la décision d'innover. L'étude identifiera les besoins et les possibilités de transformer les entreprises conventionnelles en entreprises agroalimentaires holistiques.

Cet objectif porte sur la transformation des pratiques agricoles conventionnelles en modèles d'entreprise durables et holistiques. Il analysera la demande du marché pour des produits durables, la disponibilité des ressources et le besoin d'éducation et de soutien pour les agriculteurs et les entreprises. Identifier les innovations ayant un potentiel de transformation :

Enfin, cet objectif se concentre sur l'identification et l'évaluation d'innovations spécifiques susceptibles de révolutionner le secteur agroalimentaire. Il s'agit notamment des technologies émergentes, des modèles d'entreprise innovants et des pratiques agricoles qui favorisent la durabilité et l'efficacité. Les questionnaires ont été essentiels pour recueillir des informations précieuses sur les besoins et les motivations en matière d'innovation dans le secteur agroalimentaire.

L'identification des besoins et des opportunités de transformation des entreprises conventionnelles en entreprises agroalimentaires holistiques ainsi que la reconnaissance des innovations ayant un potentiel de transformation sont des étapes cruciales dans le développement d'un secteur agroalimentaire innovant et durable. Cette recherche fournit une base solide pour formuler des stratégies efficaces et stimuler l'esprit d'entreprise et d'innovation dans l'agriculture.

2.2 Recherche par questionnaire

L'échantillon de recherche était composé de trois catégories principales : les entrepreneurs, les étudiants et les enseignants/chercheurs, sélectionnés à l'aide de la méthode d'échantillonnage proportionnel stratifié afin de garantir la représentativité de chaque groupe en fonction de sa taille dans la population totale. La taille et la structure de l'échantillon ont été déterminées sur la base des données de l'annuaire statistique de 2022. Un aspect problématique de cette recherche est la faible proportion de femmes dans ces échantillons, c'est pourquoi un quota de 30 % a été fixé pour assurer l'équité et la représentativité.

Dans ce qui suit, les arguments en faveur de l'inclusion d'un quota de femmes sont présentés en termes de principes d'équité et de représentativité, de conformité avec les politiques de genre et les normes internationales, et d'amélioration de la validité et de la profondeur des données. Une représentation adéquate des femmes dans l'enquête permet d'obtenir une image plus complète des défis et des besoins du secteur agroalimentaire et de soutenir les objectifs de développement durable des Nations unies. C'est pourquoi nous avons sélectionné des échantillons distincts et bien structurés dans des universités du Kenya, du Nigeria et du Togo.

L'échantillon étudié se compose de trois catégories : les entrepreneurs, les étudiants et les enseignants et chercheurs.

La méthode d'échantillonnage était l'échantillonnage stratifié proportionnel, selon lequel une part proportionnelle des répondants a été sélectionnée dans chaque strate en fonction de la taille de chaque strate dans la population totale. Cela a permis de garantir une représentation adéquate de chaque groupe en fonction de son importance dans la population.

La taille et la structure de l'échantillon ont été déterminées sur la base des données de l'annuaire statistique (2022) de chaque pays.

La part des femmes dans ces échantillons est une question délicate. Les femmes sont peu nombreuses dans la population totale des entrepreneurs, des étudiants et des enseignants/chercheurs. Cependant, il est important de connaître l'impact de cette variable et il a donc été convenu d'une pondération de 30 % dans tous les échantillons.

Équité et représentativité : L'utilisation d'un quota de femmes soutient le principe d'équité en garantissant que les voix des femmes sont entendues dans la recherche, même dans les domaines où elles sont sous-représentées. Cela se justifie par les engagements internationaux en faveur de l'égalité des sexes, tels que les objectifs de développement durable (ODD) des Nations unies, qui promeuvent l'égalité des sexes et l'autonomisation de toutes les femmes et filles (ONU Femmes ;, Objectifs de développement durable des Nations unies, Franceschet S. et al. 2024).

Politiques de genre et normes internationales : L'utilisation d'un quota reflète la nécessité de respecter les engagements internationaux en matière d'égalité des sexes, tels que ceux stipulés par les Nations unies, qui soulignent l'importance de réduire l'inégalité entre les sexes dans la participation à la population active et aux postes de direction (ONU Femmes ; Objectifs de développement durable des Nations unies).

Validité et profondeur des données : L'inclusion d'un pourcentage adéquat de femmes dans l'étude améliore la validité et la pertinence des données, en fournissant une image plus complète de la question étudiée. Les femmes sont souvent confrontées à des obstacles et à des défis différents, et il est important de les comprendre pour formuler des politiques efficaces (Objectifs de développement durable des Nations unies, ONU Femmes).

Impact culturel et social : La reconnaissance du travail non rémunéré et des responsabilités domestiques, principalement assumés par les femmes, nécessite une représentation adéquate des femmes dans la recherche afin de mettre en lumière ces questions souvent négligées. L'argument repose sur la nécessité de modifier les rôles traditionnels des hommes et des femmes et de promouvoir une redistribution équitable du travail (ONU Femmes, 2022 ; Krook ML., 2006).

En conséquence, les échantillons distincts et distribués par les universités sont les suivants :

Kenya

UNIVERSITÉ DU SUD-EST DU KENYA - SEKU

Échantillon d'entrepreneurs

- 13 femmes entrepreneurs propriétaires d'une petite entreprise de production agricole
- 29 hommes entrepreneurs possédant une petite entreprise de production agricole
- 5 femmes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 11 hommes entrepreneurs possédant une grande entreprise de production agricole
- 1 femme chef d'entreprise possédant une petite entreprise de transformation de produits agricoles
- 3 hommes entrepreneurs possédant une petite entreprise de transformation de produits agricoles
- 1 femme chef d'entreprise d'une grande entreprise de transformation de produits agricoles
- 1 hommes entrepreneurs d'une grande entreprise de transformation de produits agricoles
- 2 femmes entrepreneurs ayant une petite entreprise dans le domaine du commerce et d'autres services
- 6 hommes entrepreneurs ayant une petite entreprise dans le domaine du commerce et des autres services
- 0 femmes entrepreneurs ayant une grande entreprise active dans le commerce et les autres services
- 2 hommes entrepreneurs ayant une grande entreprise dans le domaine du commerce et des autres services

Échantillon d'étudiants

- 28 étudiantes de premier cycle en production agricole
- 65 étudiants de premier cycle de sexe masculin se spécialisant dans la production agricole
- 10 étudiantes en master de production agricole
- 23 étudiants de master en production agricole
- 2 doctorantes en production agricole
- 5 doctorants masculins spécialisés dans la production agricole
- 3 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 6 étudiants de premier cycle de sexe masculin, spécialisés dans la transformation des produits agricoles
- 1 étudiante en master, spécialisée dans la transformation des produits agricoles
- 2 étudiants en master, spécialisés dans la transformation des produits agricoles
- 1 doctorante spécialisée dans la transformation des produits agricoles
- 5 étudiantes de premier cycle en commerce et autres services alimentaires
- 12 étudiants de premier cycle de sexe masculin, spécialisés dans le commerce et les autres services alimentaires
- 2 étudiantes en master à dominante commerce et autres services de restauration
- 5 étudiants masculins en master avec une prédominance pour le commerce et les autres services de restauration
- 1 doctorante à dominante commerce et autres services de restauration

Échantillon d'enseignants

- 4 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 2 femmes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 5 hommes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

ARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY - JOOUST

Échantillon d'entrepreneurs

- 12 femmes entrepreneurs propriétaires d'une petite entreprise engagée dans la production agricole
- 30 hommes entrepreneurs propriétaires d'une petite entreprise engagée dans la production agricole
- 4 femmes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 11 hommes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 1 femme chef d'entreprise propriétaire d'une petite entreprise de transformation de produits agricoles
- 2 hommes entrepreneurs propriétaires d'une petite entreprise de transformation de produits agricoles
- 0 femmes entrepreneurs possédant une grande entreprise de transformation de produits agricoles
- 2 hommes entrepreneurs possédant une grande entreprise de transformation de produits agricoles
- 3 femmes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 6 hommes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 1 femme chef d'entreprise propriétaire d'une grande entreprise active dans le commerce et les autres services
- 1 homme entrepreneur propriétaire d'une grande entreprise de commerce et d'autres services

Échantillon d'étudiants

- 28 étudiantes de premier cycle en production agricole
- 66 étudiants de premier cycle de sexe masculin se spécialisant dans la production agricole
- 10 étudiantes en master de production agricole
- 24 étudiants de master en production agricole
- 2 doctorantes en production agricole
- 4 doctorants masculins spécialisés dans la production agricole
- 2 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 6 étudiants de premier cycle de sexe masculin, spécialisés dans la transformation des produits agricoles
- 1 étudiante en master dont le domaine d'études prédominant est la transformation des produits agricoles et autres services alimentaires
- 2 étudiantes en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 4 étudiants masculins en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 1 doctorante dont le domaine d'études prédominant est le commerce et les autres services alimentaires
- 2 doctorants de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services alimentaires

Échantillon d'enseignants

- 3 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 8 hommes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 3 femmes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 6 hommes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, le comportement et d'autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

Nigéria

UNIVERSITE FEDERALE NDUFU COMME IKWO AE-FUNAI

Échantillon d'entrepreneurs

- 18 femmes entrepreneurs propriétaires d'une petite entreprise engagée dans la production agricole
- 43 hommes entrepreneurs propriétaires d'une petite entreprise de production agricole
- 4 femmes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 10 hommes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 1 femme chef d'entreprise propriétaire d'une petite entreprise de transformation de produits agricoles
- 2 hommes entrepreneurs propriétaires d'une petite entreprise de transformation de produits agricoles
- 0 femmes entrepreneurs possédant une grande entreprise de transformation de produits agricoles
- 1 homme entrepreneur possédant une grande entreprise de transformation de produits agricoles
- 2 femmes chefs d'entreprise possédant une petite entreprise dans le domaine du commerce et des autres services
- 5 hommes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 2 femmes chefs d'entreprise propriétaires d'une grande entreprise active dans le commerce et les autres services
- 5 hommes entrepreneurs possédant une grande entreprise active dans le commerce et les autres services

Échantillon d'étudiants

- 33 étudiantes de premier cycle en production agricole
- 75 étudiants de premier cycle de sexe masculin spécialisés dans la production agricole
- 13 étudiantes en master de production agricole
- 28 étudiants de master en production agricole
- 5 doctorantes spécialisées dans la production agricole
- 12 doctorants masculins spécialisés dans la production agricole
- 2 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 5 étudiants de premier cycle de sexe masculin spécialisés dans la transformation des produits agricoles1 femeie masteranzi cu domeniul de studii predominant în procesarea produselor agricole other food services
- 2 étudiantes en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 5 étudiants masculins en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 1 doctorante dont le domaine d'études prédominant est le commerce et les autres services alimentaires
-

- 2 doctorants de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services alimentaires
-

Eşantion profesori

- 3 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 8 hommes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 2 femmes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 6 hommes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, le comportement et d'autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

UNIVERSITÉ FÉDÉRALE DE TECHNOLOGIE, MINNA FUTMINNA

Échantillon d'entrepreneurs

- 19 femmes entrepreneurs propriétaires d'une petite entreprise engagée dans la production agricole
- 43 hommes entrepreneurs propriétaires d'une petite entreprise de production agricole
- 4 femmes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 10 hommes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 1 femme chef d'entreprise propriétaire d'une petite entreprise de transformation de produits agricoles
- 3 hommes entrepreneurs propriétaires d'une petite entreprise de transformation de produits agricoles
- 1 femme chef d'entreprise possédant une grande entreprise de transformation de produits agricoles
- 1 hommes entrepreneurs possédant une grande entreprise de transformation de produits agricoles
- 2 femmes chefs d'entreprise possédant une petite entreprise dans le domaine du commerce et des autres services
- 4 hommes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 1 femme chef d'entreprise propriétaire d'une grande entreprise de commerce et d'autres services
- 3 hommes entrepreneurs propriétaires d'une grande entreprise de commerce et d'autres services

Échantillon d'étudiants

- 32 étudiantes de premier cycle en production agricole
- 78 étudiants de premier cycle de sexe masculin se spécialisant dans la production agricole
- 12 étudiantes en master de production agricole
- 31 étudiants de master en production agricole
- 5 doctorantes spécialisées dans la production agricole
- 11 doctorants masculins spécialisés dans la production agricole
- 2 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 5 étudiants de premier cycle de sexe masculin spécialisés dans la transformation des produits agricoles 1 étudiante en master spécialisée dans la transformation des produits agricoles
- 2 étudiants en master, spécialisés dans la transformation des produits agricoles
- 6 étudiantes de premier cycle en commerce et autres services alimentaires
- 12 étudiants de premier cycle de sexe masculin, spécialisés dans le commerce et les autres services alimentaires

- 2 étudiantes en master de commerce et autres services alimentaires
- 5 étudiants masculins en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 1 doctorante dont le domaine d'études prédominant est le commerce et les autres services alimentaires
- 2 doctorants de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services alimentaires

Échantillon d'enseignants

- 4 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 8 hommes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 3 femmes avec un domaine d'expertise principal Sciences de l'alimentation et de la nutrition 5 hommes avec un domaine d'expertise principal Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, le comportement et d'autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

Togo

UNIVERSITE DE KARA UK

Échantillon d'entrepreneurs

- 8 femmes entrepreneurs propriétaires d'une petite entreprise engagée dans la production agricole
- 19 hommes entrepreneurs propriétaires d'une petite entreprise de production agricole
- 5 femmes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 10 hommes entrepreneurs propriétaires d'une grande entreprise de production agricole
- 1 femme chef d'entreprise propriétaire d'une petite entreprise de transformation de produits agricoles
- 3 hommes entrepreneurs propriétaires d'une petite entreprise de transformation de produits agricoles
- 1 femme chef d'entreprise possédant une grande entreprise de transformation de produits agricoles
- 2 hommes entrepreneurs possédant une grande entreprise de transformation de produits agricoles
- 3 femmes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 6 hommes entrepreneurs possédant une petite entreprise dans le domaine du commerce et des autres services
- 1 femme chef d'entreprise propriétaire d'une grande entreprise active dans le commerce et les autres services
- 2 hommes entrepreneurs possédant une grande entreprise active dans le commerce et les autres services

Échantillon d'étudiants

- 21 étudiantes de premier cycle en production agricole
- 48 étudiants de premier cycle de sexe masculin se spécialisant dans la production agricole
- 8 étudiantes en master de production agricole
- 17 étudiants de master en production agricole
- 2 doctorantes en production agricole
- 3 doctorants masculins spécialisés dans la production agricole
- 3 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 8 étudiants de premier cycle de sexe masculin, spécialisés dans la transformation des produits agricoles

- 1 étudiante en master, spécialisée dans la transformation des produits agricoles
- 3 étudiants en master spécialisés dans la transformation des produits agricoles
- 1 doctorante spécialisée dans la transformation des produits agricoles
- 6 étudiantes de premier cycle en commerce et autres services de restauration
- 14 étudiants masculins de premier cycle en commerce et autres services alimentaires
- 2 étudiantes en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 5 étudiants masculins en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 1 doctorante dont le domaine d'études prédominant est le commerce et les autres services alimentaires
- 1 doctorant de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services alimentaires

Échantillon d'enseignants

- 4 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 8 hommes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 2 femmes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 5 hommes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, le comportement et d'autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

UNIVERSITE DE LOME UL

Échantillon d'entrepreneurs

- 8 femmes entrepreneurs propriétaires d'une petite entreprise
- 19 hommes entrepreneurs possédant une petite entreprise
- 4 femmes entrepreneurs propriétaires d'une grande entreprise
- 11 hommes entrepreneurs propriétaires d'une grande entreprise
- 1 femme chef d'entreprise propriétaire d'une petite entreprise
- 3 hommes entrepreneurs possédant une petite entreprise
- 1 femme chef d'entreprise propriétaire d'une grande entreprise
- 2 hommes entrepreneurs propriétaires d'une grande entreprise
- 2 femmes entrepreneurs propriétaires d'une petite entreprise
- 7 hommes entrepreneurs possédant une petite entreprise
- 1 femme chef d'entreprise propriétaire d'une grande entreprise
- 2 hommes entrepreneurs propriétaires d'une grande entreprise

Échantillon d'étudiants

- 20 étudiantes de premier cycle en production agricole
- 48 étudiants de premier cycle de sexe masculin se spécialisant dans la production agricole
- 7 étudiantes en master avec spécialisation en production agricole
- 17 étudiants de master en production agricole
- 1 doctorante en production agricole

- 4 doctorants masculins spécialisés dans la production agricole
- 4 étudiantes de premier cycle spécialisées dans la transformation des produits agricoles
- 8 étudiants de premier cycle de sexe masculin, spécialisés dans la transformation des produits agricoles
- 2 étudiantes en master dont le domaine d'études prédominant est la transformation des produits agricoles
- 3 étudiants en master dont le domaine d'études prédominant est la transformation des produits agricoles
- 1 doctorante dont le domaine d'étude prédominant est la transformation des produits agricoles
- 1 doctorant dont le domaine d'étude prédominant est la transformation des produits agricoles
- 6 étudiantes de premier cycle dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 14 étudiants de premier cycle de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 2 étudiantes en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 5 étudiants masculins en master dont le domaine d'études prédominant est le commerce et les autres services de restauration
- 1 doctorante dont le domaine d'études prédominant est le commerce et les autres services alimentaires
- 1 doctorant de sexe masculin dont le domaine d'études prédominant est le commerce et les autres services de restauration

Échantillon d'enseignants

- 3 femmes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 8 hommes dont le principal domaine d'expertise est l'agriculture et l'agro-technologie
- 3 femmes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 7 hommes dont le domaine d'expertise principal est l'économie et la gestion d'entreprise
- 3 femmes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 6 hommes dont le domaine d'expertise principal est Sciences de l'alimentation et de la nutrition
- 3 femmes dont le principal domaine d'expertise est les sciences sociales, le comportement et d'autres sciences pertinentes
- 7 hommes dont le principal domaine d'expertise est les sciences sociales, comportementales et autres sciences pertinentes

La structure de l'échantillon est indicative et peut être modifiée dans une proportion de 10 à 20 % pour chaque catégorie. Les modifications peuvent être déterminées en particulier si les enquêteurs-chercheurs considèrent qu'une catégorie de taille particulière est plus pertinente dans leur pays ou s'il est nécessaire d'introduire un autre maillon dans la chaîne d'approvisionnement agroalimentaire. Par exemple : 14 entrepreneurs d'une petite entreprise, 5 d'une entreprise moyenne et 1 d'une grande entreprise pourraient être interrogés.

Application du questionnaire

Le questionnaire a été administré en ligne, en ligne numérique et sur papier pour les participants incapables de répondre en ligne ou sur un PC. Les liens vers les questionnaires pour chaque université

Kenya

UNIVERSITÉ DU SUD-EST DU KENYA - SEKU

Questionnaire pour les entrepreneurs

https://docs.google.com/forms/d/e/1FAIpQLSeG5Z2-1ccKeUcscmuBtfe3SG9b7dqWHnIO-uae6nO9VZOr-A/viewform?usp=sf_link

Questionnaire pour les étudiants

https://docs.google.com/forms/d/e/1FAIpQLSdhX_Oe2DMwe8o3oUzle_lP3zUUWo7wP2RNgdkF7qAgOgdOQg/viewform?usp=sf_link
Questionnaire pour les professeurs
https://docs.google.com/forms/d/e/1FAIpQLScPvFWz5NadScIJ-fanhtZkH2p3yH9ryX0lw0irJoYbXn96dg/viewform?usp=sf_link

ARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY - JOOUST
Questionnaire pour les entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdo5cOhqKanZ4WzmmK_VSN116XO5QrTJZ6BE5P1GhyCoUL9RQ/viewform?usp=sf_link
Questionnaire pour les étudiants
https://docs.google.com/forms/d/e/1FAIpQLSeJr05Dn7D1lXghYN8xL0Jmbqdepl7y1xcmTyjZdbiXNAVEIA/viewform?usp=sf_link
Questionnaire pour les professeurs
https://docs.google.com/forms/d/e/1FAIpQLSefveIYzPKOgLaR3INC86OItkymBDBHcJ9gwfTVtgfqDFI0IQ/viewform?usp=sf_link

Nigéria
FEDERAL UNIVERSITY NDUFU ALIKE IKWO - AE-FUNAI
Questionnaire pour les entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdJyoBOVnQ6XwnIa786FYn1LmM7ipvZSeAgvpugPng71YBwJg/viewform?usp=sf_link
Questionnaire pour les étudiants
https://docs.google.com/forms/d/e/1FAIpQLSegquCDKEa9cIOxWbNO7EY5lwjT8rODMMbkLRThh5FvXl_rmw/viewform?usp=sf_link
Questionnaire pour les professeurs
https://docs.google.com/forms/d/e/1FAIpQLSdQyq7NR6hMJLwP9iKabYd2FUup68oyvdKi72GC_LTCzhrtTw/viewform?usp=sf_link

UNIVERSITÉ FÉDÉRALE DE TECHNOLOGIE, MINNA - FUTMINNA
Questionnaire pour les entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSdn4v1YJ0AXfGT-UnLvMwqdoBdfThJqlEH5YGebj1jMW-uttg/viewform?usp=sf_link
Questionnaire pour les étudiants
https://docs.google.com/forms/d/e/1FAIpQLSejPfZaWsV_pOOH1JMoqHTcxW6wUCw4sle65QzcRk9o1_P63g/viewform?usp=sf_link
Questionnaire pour les professeurs
https://docs.google.com/forms/d/e/1FAIpQLSfGNTihdwFV0E3zbEYEkQaG56CiQGpHYX4-SUUvblV7qtA29w/viewform?usp=sf_link

Togo
UNIVERSITE DE KARA - UK
Questionnaire pour les entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSf1vox-SSehm7cdXVUoOhkU9PsYzbNl9tBCZzFPrkK7KIQq4A/viewform?usp=sf_link
Questionnaire pour les étudiants
https://docs.google.com/forms/d/e/1FAIpQLSc48G3bDUD85Hs7tAEHd2s-ZbIhsKCeP5BLSMfmV3mksP1CIg/viewform?usp=sf_link
Questionnaire pour les professeurs

https://docs.google.com/forms/d/e/1FAIpQLSc2yZGLYRvTwP-Oj9Fb6lu7GX0LCBv3LMaqj7FJL4-4HMLHKA/viewform?usp=sf_link

UNIVERSITE DE LOME - UL
Questionnaire pour les entrepreneurs
https://docs.google.com/forms/d/e/1FAIpQLSercSRH3WwNJFr7vtSENQ_vLUWFvhiazO9m0sOvWqVlNkpVQQ/viewform?usp=sf_link
Questionnaire pour les étudiants
https://docs.google.com/forms/d/e/1FAIpQLSedhFbazArr6NxPYQ1OQkGcZyTHJhKJ9u7xGeDBJyWrRqdwPg/viewform?usp=sf_link
Questionnaire pour les professeurs
https://docs.google.com/forms/d/e/1FAIpQLSdEw69lff3BWT0fXgAcWJ-CTrfURJ9t3y-HVKJ9P0SaAmLzEA/viewform?usp=sf_link

Le questionnaire a été administré en ligne et sur papier pour les participants incapables de répondre en ligne ou sur un PC. Les formulaires de questionnaire en format modifiable ont été joints au plan de recherche (annexe 2). Les réponses sur papier ont été converties en format numérique par les chercheurs sur le terrain. Elles ont été téléchargées dans le fichier Excel joint à ce plan.

Cette recherche apporte une contribution significative à la compréhension de la dynamique et des défis du secteur agroalimentaire au Kenya, au Nigeria et au Togo. L'utilisation de questionnaires en ligne et hors ligne a permis de garantir l'accessibilité et l'inclusion des participants qui n'ont pas accès à la technologie, facilitant ainsi la collecte de données complètes et représentatives. Les résultats obtenus serviront de base à la formulation de stratégies efficaces et à la promotion de l'innovation et de l'esprit d'entreprise dans le secteur agroalimentaire, avec un impact positif sur le développement durable et équitable.

2.3 Résultats du questionnaire et discussions

Le secteur agroalimentaire global est confronté à un besoin pressant d'adaptation et d'innovation. L'esprit d'entreprise dans ce secteur joue un rôle clé dans la construction d'un avenir durable, mais pour prospérer, les entrepreneurs doivent naviguer dans un paysage plein d'obstacles et d'opportunités.

À la suite d'un questionnaire détaillé conçu pour recueillir les perceptions et les expériences des entrepreneurs, nous avons accumulé un certain nombre d'informations précieuses qui reflètent leurs motivations, leurs contraintes et leurs besoins. Cette analyse détaillée explore différents aspects de la pensée entrepreneuriale et de l'innovation dans l'agroalimentaire, de l'importance de l'accès au financement et aux ressources au rôle crucial de l'éducation et de la collaboration interdisciplinaire.

Par conséquent, l'interprétation des réponses donne une image claire de ce dont le secteur agroalimentaire holistique a besoin pour soutenir et stimuler une pensée entrepreneuriale efficace et adaptative.

1. Facteurs et défis clés qui stimulent la pensée entrepreneuriale

Financement et accès aux ressources

- Les entrepreneurs soulignent que l'accès au financement est crucial pour lancer et soutenir des initiatives entrepreneuriales.
- Le mentorat est considéré comme un moyen essentiel de fournir des conseils et un soutien aux nouveaux arrivants, en les aidant à développer une pensée innovante et à relever les défis.

Éducation et formation

- Il existe un besoin évident de programmes éducatifs qui encouragent la pensée critique et les compétences entrepreneuriales spécifiques au secteur agroalimentaire.

- Les cours doivent combiner la théorie et la pratique, en fournissant aux étudiants et aux entrepreneurs des expériences de la vie réelle et des études de cas pertinentes pour l'industrie.

2. Obstacles au développement de la pensée entrepreneuriale

Bureaucratie et obstacles juridiques

- Des réglementations strictes et des procédures compliquées peuvent décourager les entreprises innovantes, les entrepreneurs appelant à la simplification pour faciliter la création d'entreprises et l'innovation.
- Les répondants demandent un cadre réglementaire plus souple qui permette une adaptation rapide à l'évolution du marché et de la technologie.

Manque d'infrastructures adéquates

- L'insuffisance des infrastructures, telles que les laboratoires d'essai ou les installations de production, limite la capacité à développer des prototypes et à tester les innovations.
- Il est nécessaire d'investir dans des espaces de travail pour soutenir l'expérimentation et le développement de nouveaux produits.

3. Moyens efficaces de stimuler la pensée entrepreneuriale

Mise en œuvre de nouvelles technologies

- L'intégration de technologies avancées telles que l'intelligence artificielle et l'IdO dans les processus de production peut conduire à leur optimisation et au développement de nouvelles solutions agroalimentaires.
- Ces technologies peuvent contribuer à rationaliser la chaîne d'approvisionnement et à réduire les déchets, ce qui ouvre de nouvelles perspectives aux entrepreneurs.

Ateliers et séminaires

- Il est important d'organiser des ateliers et des séminaires réunissant des experts du secteur et des entrepreneurs pour partager des connaissances et développer des réseaux.
- Ces réunions peuvent stimuler l'échange d'idées et identifier de nouvelles possibilités de collaboration et de partenariat.

4. Rôle du gouvernement et des institutions éducatives

Soutien et financement du programme

- Il est nécessaire de mettre en place des programmes de soutien gouvernementaux qui permettent d'accéder à des ressources financières par le biais de subventions ou d'incitations fiscales.
- Les pouvoirs publics pourraient jouer un rôle essentiel dans la création d'une base solide pour les jeunes entreprises en supprimant les obstacles inutiles et en fournissant des ressources essentielles.

Réformes de l'éducation

- Les cours et les programmes doivent être mis à jour pour refléter les besoins et les tendances actuels du secteur agroalimentaire.
- Il est essentiel d'améliorer les programmes d'études pour y inclure des éléments relatifs à la durabilité, aux technologies émergentes et à la gestion d'entreprise, afin de former les futurs leaders du secteur.

Cette approche détaillée donne un aperçu approfondi des besoins et des attentes des entrepreneurs dans le secteur agroalimentaire holistique et souligne l'importance du soutien financier, éducatif et législatif pour stimuler l'innovation et l'esprit d'entreprise dans le secteur.

3. LA MÉTHODE DE RECHERCHE PAR GROUPE DE DISCUSSION

La conception de la recherche par groupes de discussion visait à explorer et à stimuler l'innovation dans l'agro-industrie holistique, conformément aux objectifs d'identification des besoins et des possibilités de transformation des entreprises conventionnelles en modèles holistiques et de renforcement de l'esprit d'entreprise. Les objectifs comprenaient l'analyse des moyens par lesquels les chercheurs, les étudiants et les entrepreneurs peuvent travailler ensemble pour promouvoir l'innovation transformatrice, l'évaluation de la capacité des participants à être des pionniers de l'innovation holistique et l'exploration des processus par lesquels les entreprises peuvent adopter des pratiques agricoles holistiques. Les participants, des professeurs et des chercheurs d'universités du Kenya, du Nigeria et du Togo, ont utilisé des jeux de rôle pour simuler différents scénarios dans le secteur de l'agroalimentaire holistique.

Dans chaque pays, les sessions des groupes de discussion ont été animées par des experts qui ont guidé les débats, en se concentrant sur l'identification des innovations ayant un potentiel de transformation et en encourageant la collaboration en vue d'une innovation holistique. Les études de cas, sélectionnées pour illustrer des défis et des opportunités spécifiques, ont permis aux participants d'expérimenter différents rôles au sein du secteur agroalimentaire holistique, en proposant des solutions innovantes et en émettant des critiques constructives. Ces sessions ont généré des données qualitatives précieuses qui sont essentielles pour développer des stratégies adaptées aux besoins et aux conditions locales, promouvant ainsi l'innovation et l'esprit d'entreprise dans l'agriculture holistique.

3.1 But et objectifs de la session du groupe de discussion

La recherche par groupes de discussion a fourni une approche détaillée et participative pour explorer et relever les défis du secteur agroalimentaire holistique. L'implication d'un groupe diversifié de participants, comprenant des enseignants, des chercheurs, des entrepreneurs et des représentants du gouvernement, a permis de générer de multiples perspectives et diverses solutions pour stimuler la pensée entrepreneuriale et l'innovation. La méthodologie du jeu de rôle a permis un échange d'idées interactif, dynamique et efficace, contribuant à l'élaboration de stratégies pratiques et applicables.

Les objectifs de la session étaient les suivants

- Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale dans le contexte de l'agriculture holistique.
- Identifier les besoins et les contraintes spécifiques pour stimuler le potentiel d'innovation dans l'agriculture.
- Analyser le potentiel d'innovation par la collaboration entre les chercheurs, les étudiants et les entrepreneurs dans le domaine de l'agriculture holistique.
- Évaluer le potentiel des étudiants et des entrepreneurs à devenir des innovateurs dans le domaine de l'agriculture holistique.
- Examiner le potentiel de transformation des entreprises traditionnelles en pratiques agricoles holistiques.
- Étudier comment les innovations dans le domaine de l'agriculture holistique peuvent être transformées en entreprises en pleine croissance.

Les résultats de cette recherche ont été essentiels à la formulation de politiques et d'initiatives visant à soutenir l'agriculture holistique et à transformer les innovations en entreprises prospères. Les groupes de discussion ont fourni une plateforme de collaboration et d'apprentissage entre les différentes parties prenantes, promouvant ainsi un développement durable et équitable dans le secteur agroalimentaire. L'application des conclusions et des solutions générées a contribué de manière significative à la croissance et au développement de l'esprit d'entreprise et de l'innovation dans l'agriculture.

3.2 Méthodologie de la recherche sur les groupes de discussion

Le plan de recherche en groupe intitulé "Entrepreneuriat dans l'agroforesterie holistique" vise à recueillir des données qualitatives auprès de professeurs et de chercheurs d'universités au Kenya, au Nigeria et au Togo. Les participants assisteront à des sessions individuelles organisées pays par pays, chaque session comprenant environ dix personnes. Les discussions sont 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 d'appui, des enseignants, des chercheurs, des banquiers et des consommateurs. L'objectif principal de ces discussions 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.

Cette session s'est tenue dans les universités SEKU et JOOUST au Kenya, dans le cadre de la visite de l'équipe de l'IULS Roumanie dans ces universités.

Les discussions au sein du groupe ont été structurées selon les catégories de l'analyse SWOT sur deux éléments principaux : Faiblesses et menaces (d'une part) et Forces et opportunités (d'autre part). Des propositions d'action ont été demandées pour chacune de ces catégories.

Organisations et représentants qui devraient participer aux sessions des groupes de discussion :

1) Universités et centres de recherche : Un chercheur ou un professeur spécialisé dans l'agriculture durable ayant une expertise dans les méthodes agricoles holistiques innovantes.
2. les producteurs et les agriculteurs : Un agriculteur innovant ou un responsable d'association d'agriculteurs qui a déjà mis en œuvre des pratiques holistiques ou qui s'y intéresse.
3. Consommateurs : Un représentant d'une organisation de consommateurs ou un consultant en comportement des consommateurs qui peut fournir des informations sur la demande de produits agricoles durables.
4. les entreprises de la chaîne d'approvisionnement : Un responsable des achats ou de la logistique d'une entreprise agroalimentaire intéressé par la mise en place de chaînes d'approvisionnement durables et efficaces.
5. les investisseurs et les fonds d'investissement : Un analyste ou un gestionnaire de fonds qui comprend le marché de l'agroalimentaire et qui est intéressé par l'investissement.
6. les organisations internationales : Un représentant d'une organisation telle que la FAO ou le Programme alimentaire mondial ayant une expérience dans la promotion de l'agriculture holistique au niveau mondial.
7. Eglise : Un chef religieux ou un représentant d'une organisation caritative liée à l'église qui promeut les valeurs morales de protection de l'environnement et de la communauté.
8. institution culturelle : Un conservateur ou un directeur de programme d'un musée agricole ou d'un centre culturel qui peut mettre en évidence le lien entre les traditions et l'agriculture durable.
9. Banques : Un agent de crédit ou un gestionnaire de portefeuille spécialisé dans le financement de l'agriculture et qui comprend les risques et les possibilités d'investissement dans l'agriculture durable.
10. Gouvernement et régulateurs : Un fonctionnaire ou un analyste de la politique agricole qui élabore des réglementations, des programmes et des subventions pour soutenir l'agriculture durable au niveau national.
11. ONG : Un gestionnaire de projet ou de programme qui coordonne des initiatives de développement rural durable et qui a l'habitude de travailler directement avec les agriculteurs et les communautés.

Dans le contexte actuel de défis environnementaux et sociaux croissants, l'agriculture holistique apparaît comme une solution clé pour la durabilité de l'agriculture. L'adoption de cette approche nécessite une vision innovante et une collaboration intensive entre les différentes parties prenantes. La recherche actuelle vise donc à explorer et à exploiter le potentiel d'innovation des différents acteurs du système agroalimentaire. L'objectif est d'identifier, d'analyser et de stimuler l'innovation et l'esprit d'entreprise dans l'agriculture holistique, en impliquant un large éventail de parties prenantes, des universités aux gouvernements, et des agriculteurs aux investisseurs, chacun d'entre eux ayant un rôle clé à jouer dans l'élaboration de l'avenir de l'agriculture durable.

1. Identifier les besoins spécifiques, les contraintes et les méthodes pour encourager la pensée entrepreneuriale dans le contexte de l'agriculture holistique :

Universités et instituts de recherche : Les professeurs et les chercheurs apportent leur expertise dans les nouvelles théories et méthodes essentielles à l'innovation et à l'esprit d'entreprise.

Les banques : Des experts financiers qui peuvent discuter des moyens de financer des initiatives entrepreneuriales dans le domaine de l'agriculture holistique.

2. Identifier les besoins et les contraintes spécifiques pour accroître le potentiel d'innovation dans l'agriculture :

Entreprises de la chaîne d'approvisionnement : Les gestionnaires qui peuvent discuter de la manière dont les pratiques holistiques peuvent être intégrées pour rendre les chaînes d'approvisionnement plus efficaces et plus durables.

Les ONG : L'expérience directe des projets sur le terrain peut fournir des indications précieuses sur les innovations applicables en matière de pratiques agricoles holistiques.

3. Explorer le potentiel d'innovation par la collaboration entre les chercheurs, les étudiants et les entrepreneurs dans le domaine de l'agriculture holistique :

Universités et instituts de recherche : Collaborations visant à développer de nouvelles technologies et pratiques.

Investisseurs et fonds d'investissement : Discuter du potentiel économique des innovations et de la manière dont elles peuvent être soutenues financièrement.

4. Évaluer le potentiel des étudiants et des entrepreneurs à devenir des innovateurs dans le domaine de l'agriculture holistique :

Producteurs et agriculteurs : Leur expérience pratique peut mettre en évidence les compétences nécessaires pour innover.

Organisations internationales : Perspective globale sur l'éducation et la formation des innovateurs agricoles .

5. Explorer le potentiel de transformation des entreprises traditionnelles en pratiques agricoles holistiques :

L'Église et les institutions culturelles : Leur rôle dans la défense des valeurs de durabilité et dans l'influence exercée sur les communautés locales pour qu'elles adoptent des pratiques holistiques.

Les agences gouvernementales et réglementaires : Ils peuvent fournir un cadre juridique et politique propice à la transition vers une agriculture holistique.

6. Étudier comment les innovations peuvent être transformées en entreprises en pleine croissance dans le contexte de l'agriculture holistique :

Investisseurs et fonds d'investissement : Leur rôle dans le soutien financier des startups et des entreprises innovantes dans le domaine de l'agriculture holistique.

Gouvernements et régulateurs : L'impact des réglementations et des subventions sur la promotion et l'expansion de l'innovation agricole.

La recherche a mis en évidence l'importance d'une approche collaborative et interdisciplinaire pour encourager l'innovation dans l'agriculture holistique. La participation de représentants de différents secteurs a permis d'identifier et de traiter la complexité des besoins et des opportunités dans ce domaine.

Les résultats soulignent que, grâce à un engagement conscient et durable, il est possible de transformer les défis actuels en opportunités de développer des pratiques agricoles qui non seulement respectent les principes écologiques, mais contribuent également à la prospérité économique et sociale.

Le renforcement des liens entre la recherche, la pratique et la politique peut accélérer la transition vers un système agricole holistique, durable et équitable. Cela nécessite un investissement continu dans l'éducation, l'innovation et la collaboration qui sont essentielles pour soutenir et étendre l'impact de l'agriculture holistique dans la société.

Modérateurs :

Au moins un chercheur de l'équipe de l'IULS Roumanie avec les fonctions suivantes : coordonner les discussions vers les objectifs ; assurer l'implication de tous les participants ; gérer le temps ; fournir des clarifications ; rédiger le rapport final.

Au moins deux chercheurs de l'équipe de l'université d'accueil chargés des fonctions suivantes : veiller à l'implication de tous les participants ; observer le langage non verbal, noter les idées principales des participants ; rédiger le rapport final.

La session des groupes de discussion se déroulera en deux phases : Discussions thématiques et ateliers interactifs.

Discussions thématiques

Les discussions thématiques se dérouleront avec la participation de tous les représentants.

Le temps alloué à chaque objectif sera d'environ 15 minutes.

Pour chaque objectif, les réponses des participants ont été sollicitées et le rapporteur (un chercheur modérateur de l'équipe de l'université d'accueil) notera les réponses de chaque participant sous forme de mots-clés (annexe 2). Le tableau sera conçu et rempli au cours des discussions, pour être corrigé et complété en temps réel.

Les questions pour chaque objectif :

Objectif 1 : Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale.

Quels sont, selon vous, les principaux obstacles culturels, économiques ou éducatifs au développement de l'esprit d'entreprise dans votre communauté ? Comment affectent-ils l'initiative et la capacité de créer de nouvelles entreprises agroalimentaires ?

Selon vous, quelles ressources pourraient être mobilisées et quelles opportunités pourraient être exploitées pour soutenir le développement de la pensée entrepreneuriale ? Comment ces ressources pourraient-elles être utilisées pour créer un environnement plus favorable à l'initiative entrepreneuriale ?

Objectif 2. Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler le potentiel d'innovation

Quels sont, selon vous, les principaux obstacles culturels, économiques ou technologiques à l'innovation dans le secteur agroalimentaire de votre municipalité ? Comment ces obstacles affectent-ils la capacité de la population locale à adopter ou à développer de nouvelles technologies et pratiques agricoles ?

Quelles sont les ressources existantes dans votre communauté qui pourraient être utilisées pour soutenir et stimuler l'innovation agroalimentaire ? Quelles sont les opportunités inexploitées qui, selon vous, pourraient être utilisées pour favoriser un environnement innovant dans le secteur ?

Objectif 3 : analyser le potentiel de création de triangles d'innovation entre les chercheurs, les étudiants et les entrepreneurs dans le domaine de l'agriculture holistique.

D'après votre expérience, quels sont les éléments qui facilitent ou, au contraire, entravent une collaboration efficace entre les chercheurs, les étudiants et les entrepreneurs dans le développement d'innovations pour un secteur agroalimentaire holistique ? Comment ces interactions pourraient-elles être améliorées pour maximiser le potentiel d'innovation ?

Quels types de projets conjoints entre ces groupes avez-vous observés qui génèrent les innovations les plus précieuses dans le domaine de l'agriculture holistique ? Existe-t-il des domaines spécifiques dans lesquels la synergie entre la recherche, la pratique et l'esprit d'entreprise peut être renforcée ?

Objectif 4 : analyser le potentiel des étudiants et des entrepreneurs agricoles à devenir des innovateurs dans le domaine de l'agriculture holistique.

Quelles sont les principales compétences des étudiants et des entrepreneurs de votre communauté qui pourraient les aider à contribuer à l'innovation dans l'agriculture holistique ? Quelles sont les lacunes et comment les combler ?

Quels sont les facteurs de motivation qui, selon vous, encourageraient les étudiants et les entrepreneurs à participer plus activement aux processus d'innovation agricole holistique ? Quels sont les principaux obstacles auxquels ils sont confrontés ?

Objectif 5 : analyser le potentiel de transformation des entreprises dans le domaine de l'agriculture holistique

Quels sont les exemples d'innovation dans le domaine de l'agriculture holistique qui ont eu un impact significatif sur la transformation des entreprises locales ? Comment ces changements ont-ils été perçus par la communauté et le marché ?

Quelles sont les possibilités de transposer à plus grande échelle et d'étendre les pratiques agricoles holistiques innovantes ? Quels sont les principaux marchés ou secteurs qui pourraient bénéficier le plus de ces innovations ?

Objectif 6. Potentiel des innovations à générer des entreprises en croissance

Comment des innovations spécifiques dans le domaine de l'agriculture holistique ont-elles contribué à la croissance et au développement des entreprises dans votre communauté ? Avez-vous des exemples concrets de réussite qui pourraient être reproduits ?

Quels sont, selon vous, les facteurs essentiels pour transformer une innovation dans le domaine de l'agriculture holistique en une entreprise commerciale prospère ? Comment les défis liés au financement, au marché et à la réglementation peuvent-ils être relevés ?

Ateliers interactifs

Les discussions thématiques seront organisées en trois équipes :

Équipe 1 : Innovation et politique :
- Représentants du gouvernement ou des autorités de régulation
- Représentants d'universités ou d'instituts de recherche
- Représentant d'une ONG
- Représentant de la banque

Équipe 2 : Mise en œuvre et impact sur le marché
- Représentant des producteurs et des agriculteurs
- Responsable des achats ou de la logistique d'une entreprise agroalimentaire
- Représentant d'organisations internationales
- Investisseur ou fonds d'investissement

Équipe 3 : Communauté et culture
- Chef religieux ou représentant d'une association caritative
- Représentant des consommateurs
- Représentant des institutions culturelles

Le temps alloué à chaque objectif est d'environ 15 minutes.
Les participants seront invités à répondre à chaque objectif.
Chaque équipe aura un rapporteur (un chercheur modérateur de l'université d'accueil / équipe IULS) qui notera les réponses de chaque participant sous forme de mots-clés et de conclusions.

Les questions pour chaque objectif des ateliers interactifs seront les suivantes

Objectif 1 : Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale.

Sur la base des contraintes et des opportunités identifiées, quelles actions spécifiques proposez-vous pour améliorer et stimuler la pensée entrepreneuriale dans l'agriculture ? Quelles mesures concrètes devraient être prises pour transformer ces idées en pratiques efficaces ?

Objectif 2. Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler le potentiel d'innovation

Compte tenu des contraintes et des ressources évoquées, quelles actions spécifiques recommandez-vous pour améliorer et stimuler le potentiel d'innovation dans l'agriculture communautaire ? Quelles mesures concrètes devraient être prises pour transformer ces ressources et ces opportunités en solutions pour stimuler le potentiel d'innovation ?

Objectif 3 : analyser le potentiel de création de triangles d'innovation entre les chercheurs, les étudiants et les entrepreneurs dans le domaine de l'agriculture holistique.

Compte tenu de la dynamique actuelle entre les chercheurs, les étudiants et les entrepreneurs, quelles stratégies concrètes proposez-vous pour renforcer ce réseau et stimuler un flux continu d'innovation ? Quels rôles spécifiques chaque groupe devrait-il jouer afin d'optimiser la collaboration et les résultats ?

Objectif 4 : Analyser le potentiel des étudiants et des entrepreneurs agricoles pour qu'ils deviennent des innovateurs dans le domaine de l'agriculture holistique.

Quelles initiatives ou programmes concrets proposez-vous pour soutenir et encourager les étudiants et les entrepreneurs à devenir des leaders de l'innovation dans le domaine de l'agriculture holistique ? Comment les institutions universitaires, les entreprises et les gouvernements pourraient-ils collaborer pour atteindre cet objectif ?

Objectif 5. Analyser le potentiel de transformation des entreprises dans le domaine de l'agriculture holistique

Quelles sont les stratégies que vous considérez comme essentielles pour faciliter la transformation des entreprises agroalimentaires traditionnelles en entités innovantes et durables ? Quel rôle les différents acteurs économiques et institutionnels devraient-ils jouer dans ce processus ?

Objectif 6. Potentiel de transformation des innovations en entreprises en croissance

Quelles stratégies et mesures spécifiques proposez-vous pour soutenir la transformation des innovations dans le domaine de l'agriculture holistique en entreprises évolutives et rentables ? Quel rôle la collaboration intersectorielle et le soutien des pouvoirs publics devraient-ils jouer dans ce processus ?

Vie privée et protection des données

Afin de garantir la transparence et la protection des données personnelles lors de nos sessions de groupes de discussion, chaque participant sera informé de la manière dont les informations collectées ont été utilisées et protégées.

Les participants sont invités à signer un formulaire de consentement éclairé avant le début des discussions, qui détaille l'objectif de la collecte de données, l'utilisation des données et leurs droits en vertu de la législation applicable en matière de protection des données.

Toutes les données personnelles ont été traitées de manière stricte, conservées en toute sécurité et uniquement accessibles à l'équipe de recherche autorisée. Les enregistrements audio et vidéo ont été utilisés exclusivement aux fins suivantes

documentation et d'analyse des informations discutées, et n'ont pas été publiés ou distribués sans le consentement explicite des participants. L'identité des participants sera rendue anonyme dans tous les rapports et publications résultant de ces sessions.

Après la finalisation de l'étude, toutes les données personnelles ont été supprimées ou archivées conformément aux réglementations légales, garantissant ainsi une protection et une 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.

Pour que l'organisation soit efficace au sein du groupe, il est nécessaire de s'assurer que les aspects logistiques sont bien pris en compte :

Lieu : Réserver des espaces appropriés à SEKU et JOOUST, aménagés pour faciliter les discussions de groupe, de préférence avec des tables rondes ou en forme de U pour encourager l'interaction.

Équipement technique : prévoir des projecteurs et des écrans, des appareils d'enregistrement audio.

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

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

3.3 Résultats des groupes de discussion et discussion

Afin d'évaluer la dynamique et l'efficacité des méthodologies de groupes de discussion dans le contexte du développement socio-économique, ce document vise à explorer et à discerner les aspects critiques et les résultats d'un groupe de discussion. Cette étude se concentre sur l'interprétation méticuleuse 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 les politiques et les pratiques dans les économies en développement. Dans un effort pour fournir une plateforme pour des discussions profondément analytiques et 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 concernées.

Niveau de participation et d'engagement

La participation active et l'engagement des membres ont été élevés, ce qui reflète 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. Ces derniers, bien qu'ils puissent sembler contre-productifs, sont en fait essentiels dans un groupe de discussion car ils stimulent la discussion et favorisent la pensée critique et les solutions innovantes.

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

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 d'étude de cas bien pensée.

Nouveaux arguments : L'accent mis sur le rôle de l'État 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.

Difficultés rencontrées : Les difficultés rencontrées dans certaines études de cas soulignent la nécessité de mieux clarifier les rôles et les responsabilités, suggérant que les instructions des scénarios pourraient être améliorées dans les futures sessions.

Scénarios d'accidents de la route

Le rôle de l'Etat a été accueilli avec réticence par le participant qui l'a interprété, ce qui suggère soit une méfiance à l'égard de l'efficacité des interventions gouvernementales, soit un manque d'aisance avec ce rôle, ce qui peut indiquer un domaine à améliorer dans la sélection ou la préparation des participants.

Des solutions créatives

Les discussions sur le développement d'incubateurs d'entreprises pour les étudiants mettent en évidence la pensée innovante et la vision prospective nécessaires pour transformer l'environnement universitaire et entrepreneurial.

Propositions concrètes : L'accent mis sur le rôle de l'État dans le soutien à l'innovation et à l'esprit d'entreprise indique une direction claire pour l'action future, potentiellement applicable dans la politique publique.

Défis communs

Le financement insuffisant et l'éducation limitée sont des défis récurrents dans les économies en développement, et leur identification dans les discussions confirme la pertinence et l'applicabilité des thèmes abordés aux réalités locales.

Amélioration des sessions

Les commentaires positifs sur la structure des groupes et la méthodologie suggèrent que le format des jeux de rôle est efficace, mais que la clarté des rôles et des objectifs pourrait être améliorée afin de maximiser les avantages de ce format.

Impact du format

L'approche des études de cas a généré des informations sur des actions et des processus concrets, évitant ainsi l'écueil des déclarations génériques, ce qui est essentiel pour obtenir des résultats applicables et orientés vers l'action dans les projets de développement.

L'analyse des réponses des participants aux groupes de discussion a mis en évidence plusieurs questions clés qui contribuent à la compréhension et au potentiel d'innovation et de transformation de l'agro-industrie holistique dans les établissements d'enseignement supérieur partenaires. En s'appuyant sur les données collectées et les interactions enregistrées, les sections suivantes détaillent la manière dont les contributions des différentes catégories de participants ont alimenté les discussions et guidé les conclusions.

1. Identifier les besoins et les contraintes pour stimuler la pensée entrepreneuriale

Les discussions ont révélé que les principaux obstacles au développement de la pensée entrepreneuriale sont d'ordre culturel, économique et éducatif. Les participants ont souligné la nécessité pour les programmes éducatifs d'intégrer des cours sur l'entrepreneuriat et l'innovation dans le cursus universitaire. Par exemple, un professeur d'une institution de recherche a souligné l'importance de l'apprentissage par projet, qui encourage les étudiants à développer des solutions innovantes à des problèmes réels. Les agriculteurs et les entrepreneurs ont souligné que le manque d'accès au financement et aux marchés constituait une contrainte majeure, suggérant que les établissements d'enseignement devraient faciliter l'établissement de liens plus étroits avec l'industrie.

2. **Stimuler le potentiel d'innovation**

Les barrières culturelles et technologiques ont fait l'objet d'une attention particulière, les participants discutant de la manière dont les traditions peuvent inhiber ou stimuler l'adoption de l'innovation. Des représentants d'organisations internationales ont évoqué les programmes mondiaux qui ont réussi à intégrer les nouvelles technologies dans les pratiques agricoles traditionnelles, démontrant ainsi que la transformation est possible. La nécessité d'un soutien gouvernemental cohérent pour fournir l'infrastructure nécessaire à l'innovation a également été soulignée.

3. **Créer l'innovation grâce à des collaborations triadiques**

La collaboration entre les chercheurs, les étudiants et les entrepreneurs a été jugée essentielle. Les discussions ont souligné l'importance de créer des réseaux d'innovation où les idées peuvent être testées et développées dans un environnement contrôlé. Un exemple concret est le partenariat entre une université et une entreprise

agricole locale, qui a permis aux étudiants d'appliquer directement les connaissances théoriques dans un cadre pratique, générant des solutions innovantes qui ont ensuite été mises en œuvre à grande échelle.

4. **Transformer les entreprises traditionnelles**

La capacité des entreprises existantes à adopter des pratiques holistiques a été discutée. Dans ce contexte, il a été noté que de nombreuses entreprises agricoles sont réticentes à prendre les risques associés au changement des pratiques traditionnelles. Toutefois, des exemples de réussite présentés par des représentants d'institutions culturelles ont démontré les avantages à long terme de l'adoption de tels modèles d'entreprise. Par exemple, une entreprise locale qui a adopté des techniques holistiques a réussi à augmenter sa rentabilité et à réduire son impact sur l'environnement.

5. **Transformer les innovations en entreprises viables**

La dernière partie de la discussion a porté sur la manière dont les innovations peuvent être transposées à plus grande échelle et transformées en entreprises prospères. Un facteur important identifié a été le besoin de mécanismes de financement adaptés aux besoins des jeunes entreprises innovantes. L'importance de créer des partenariats public-privé pour soutenir des innovations durables pouvant être largement adoptées a également été soulignée.

Les groupes de discussion ont fourni des informations précieuses sur la manière dont les différentes entités peuvent travailler ensemble pour encourager l'innovation et l'esprit d'entreprise dans l'agriculture holistique. Les résultats suggèrent qu'une approche intégrée, comprenant un soutien éducatif, financier et institutionnel, peut faciliter la transformation des entreprises agricoles traditionnelles en modèles holistiques innovants. Ce processus bénéficiera non seulement d'une durabilité accrue, mais contribuera également à la formation d'une nouvelle génération d'entrepreneurs prêts à relever les défis complexes du monde moderne. Cette analyse souligne la nécessité d'une collaboration continue entre toutes les parties prenantes pour faire en sorte que les innovations dans le domaine de l'agriculture holistique deviennent la norme et non l'exception.

4. Conclusions

La société mondiale est de plus en plus consciente de la nécessité d'adopter des pratiques durables et le secteur agroalimentaire holistique se situe à l'intersection de l'innovation et de la tradition, jouant un rôle important dans l'élaboration d'un avenir durable. Il offre aux entrepreneurs une occasion unique d'apporter une contribution significative à l'économie verte en adoptant et en promouvant des méthodes d'agriculture et de production innovantes.

Dans le contexte de cette dynamique, les groupes de discussion organisés visaient principalement à explorer les perceptions et les expériences des entrepreneurs dans ce secteur, en accumulant des données précieuses reflétant les besoins, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale et l'innovation.

En analysant ces réponses en détail, l'étude vise à identifier les stratégies les plus efficaces pour soutenir et stimuler le développement durable dans l'agriculture holistique.

1. Identifier les besoins spécifiques, les contraintes et les méthodes pour stimuler la pensée entrepreneuriale dans le contexte de l'agriculture holistique Les réponses indiquent un besoin clair de programmes éducatifs adaptés et d'un accès facile aux ressources financières, qui sont essentiels pour cultiver un état d'esprit entrepreneurial dans le secteur agroalimentaire holistique.
Le mentorat et les ateliers sont également reconnus comme des outils vitaux pour soutenir les entrepreneurs émergents. Il est donc essentiel de développer une infrastructure de soutien qui réponde à ces besoins complexes et favorise un solide état d'esprit entrepreneurial.

2. Identifier les besoins et les contraintes spécifiques pour stimuler le potentiel d'innovation dans l'agriculture Les barrières technologiques et législatives doivent faire l'objet d'une plus grande attention pour faciliter l'innovation.
Les participants suggèrent que la simplification des réglementations et l'amélioration de l'accès aux technologies modernes peuvent accélérer l'adoption des innovations. Une collaboration étroite entre les établissements d'enseignement, le gouvernement et le secteur privé est donc essentielle pour supprimer ces obstacles et créer un environnement favorable à l'innovation.

3. Analyser le potentiel d'innovation par la collaboration entre chercheurs, étudiants et entrepreneurs dans l'agriculture holistique L'interaction entre chercheurs, étudiants et entrepreneurs est fondamentale pour générer des solutions innovantes et applicables. La création de réseaux efficaces et le soutien d'initiatives interdisciplinaires peuvent transformer le secteur agricole, en apportant des solutions durables aux défis d'aujourd'hui.

4. Évaluer le potentiel des étudiants et des entrepreneurs à devenir des innovateurs dans l'agriculture holistique L'éducation pratique et l'accès aux ressources de développement sont essentiels pour préparer les leaders de demain dans l'innovation agricole holistique.
Les réponses suggèrent que l'intégration de cours axés sur la durabilité et les technologies émergentes dans les programmes universitaires peut améliorer la capacité d'innovation des étudiants et des entrepreneurs. Les établissements d'enseignement jouent donc un rôle essentiel dans la construction d'un avenir durable.
5. Examiner le potentiel de transformation des entreprises traditionnelles en pratiques agricoles holistiques Il existe un consensus clair sur le fait que les innovations en matière d'agriculture holistique peuvent revitaliser les entreprises traditionnelles, en apportant des avantages économiques et environnementaux significatifs. La transformation de ces entreprises nécessite une approche stratégique, notamment la sensibilisation des entrepreneurs aux avantages des pratiques durables et un soutien continu à leur mise en œuvre.

6. Étudier comment les innovations peuvent se transformer en entreprises en pleine croissance dans le contexte de l'agriculture holistique Les innovations dans le domaine de l'agriculture holistique ont un potentiel important pour se transformer en entreprises prospères, contribuant ainsi à une économie verte et durable. Le soutien à l'expansion de ces innovations, y compris un financement adéquat et des partenariats stratégiques, peut accélérer leur croissance commerciale.

Il est essentiel que les gouvernements et les investisseurs reconnaissent et soutiennent ces opportunités pour garantir un succès à long terme.

L'analyse des réponses des groupes de discussion met en évidence un paysage complexe de défis et d'opportunités dans le secteur agroalimentaire holistique. Alors que les entrepreneurs naviguent entre les contraintes législatives, culturelles et technologiques, il est essentiel de développer une infrastructure solide qui facilite l'innovation et fournit le soutien nécessaire pour transformer les idées novatrices en pratiques durables et rentables.

Les recommandations tirées des discussions fournissent une orientation claire pour les politiques et stratégies futures qui peuvent améliorer l'accès aux ressources, à l'éducation et à la collaboration intersectorielle. Ce faisant, cette recherche contribue à l'élaboration d'un cadre stratégique pour soutenir l'esprit d'entreprise dans l'agriculture holistique, essentielle pour un avenir plus vert et plus prospère.

Anexe

Anexa 1

Exemplu de formular de chestionar ofline

Bonjour,

Merci d'avoir pris le temps de participer à cette enquête. Votre contribution est très importante pour le projet "Coopération pour des nids d'innovation en agriculture holistique en Afrique subsaharienne". Cette enquête vise à identifier les besoins spécifiques, les contraintes et les méthodes pour améliorer la pensée entrepreneuriale dans le contexte de l'agroalimentaire holistique. Les pratiques agroalimentaires holistiques impliquent la prise en charge de leurs impacts sur les environnements naturels, sociaux, économiques et culturels. Veuillez répondre honnêtement et en détail pour nous aider à soutenir la croissance et l'innovation dans ce secteur vital.

Vos réponses sont extrêmement précieuses pour nos efforts. Merci de répondre avec soin aux questions et de nous aider à mieux comprendre la situation.

Nous vous remercions une nouvelle fois pour votre participation.

Je vous prie d'agréer, Madame, Monsieur, l'expression de mes salutations distinguées,

L'équipe de recherche

I. Identification des besoins, des contraintes et des méthodes pour stimuler la pensée entrepreneuriale

Explorez les principales forces et les principaux défis qui façonnent la pensée entrepreneuriale dans le domaine agroalimentaire holistique et contribuez à la création de solutions adaptées à vos besoins.

1. Quels sont, selon vous, les facteurs les plus importants et les principaux défis qui stimulent la pensée entrepreneuriale dans le domaine agroalimentaire holistique ? Veuillez sélectionner jusqu'à trois options et ajouter tout autre défi que vous rencontrez.
    - Accès au financement et aux ressources financières
    - Éducation et formation aux compétences entrepreneuriales spécialisées dans l'agroalimentaire holistique
    - Accès au mentorat et aux conseils d'experts sur le terrain
    - Développement de réseaux de soutien entre entrepreneurs dans le domaine agroalimentaire holistique
    - Autres : _____

2. Quelles sont les principales contraintes que vous rencontrez dans le développement de la pensée entrepreneuriale dans le domaine agroalimentaire holistique ? (Sélectionnez jusqu'à 3 options)
    - Bureaucratie et réglementation excessive dans l'industrie agroalimentaire
    - Manque d'accès à des ressources et infrastructures adéquates pour l'innovation dans l'agroalimentaire holistique
    - Manque de ressources humaines
    - Difficultés d'accès aux marchés pour les produits agroalimentaires innovants
    - Autres : _____

3. Quelles sont les méthodes que vous considérez comme les plus efficaces pour stimuler la pensée entrepreneuriale dans le domaine agroalimentaire holistique ? (Sélectionnez jusqu'à 3 options)
    - Organiser des programmes de mentorat et des stages dans des entreprises de l'industrie agroalimentaire holistique
    - Faciliter l'accès au financement et aux ressources de démarrage pour les entrepreneurs dans le domaine agroalimentaire holistique
    - Développer des programmes d'éducation et de formation à l'esprit d'entreprise spécifiquement adaptés au domaine agroalimentaire holistique
    - Créer des pôles et des centres d'innovation dans le domaine de l'agroalimentaire holistique afin de stimuler la collaboration et l'innovation
    - Autres : _____

4. Selon vous, que devraient faire le gouvernement ou les établissements d'enseignement pour stimuler l'esprit d'entreprise dans le domaine de l'agroalimentaire ? (Sélectionnez jusqu'à 3 options)
    - Mettre en œuvre des programmes éducatifs sur l'entrepreneuriat spécialisé dans l'agroalimentaire holistique dans les écoles et les universités, en mettant l'accent sur le développement des compétences en matière de pensée critique, d'innovation et de gestion d'entreprise.
    - Développer des programmes de mentorat et des incubateurs d'entreprises spécialisés dans l'agroalimentaire holistique qui fournissent un soutien et des conseils dans les premières étapes du développement de l'entreprise.
    - Développer des programmes de recherche appliquée et de transfert de technologie en collaboration avec les institutions de recherche et l'industrie agroalimentaire pour soutenir l'innovation et le développement de technologies durables.
    - Mettre en œuvre des programmes de soutien à l'innovation et aux jeunes pousses dans le domaine de l'agroalimentaire holistique par le biais de subventions, de facilités fiscales et d'un accès aux infrastructures et aux ressources de recherche.
    - Autres : _____

5. Imaginez que vous êtes impliqué dans un projet de création d'entreprise dans le domaine de l'agroalimentaire holistique. Quelles stratégies ou initiatives mettriez-vous en œuvre pour stimuler la pensée entrepreneuriale au sein de votre équipe et pour surmonter les obstacles potentiels rencontrés ?

II. Identification des voies pour stimuler le potentiel d'innovation

Nous vous invitons à partager vos expériences concernant les obstacles à l'innovation et à proposer des initiatives susceptibles d'accélérer la transformation du secteur agroalimentaire.

6. Quels sont, selon vous, les principaux obstacles à l'innovation dans l'agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?
    - Conditions réglementaires et bureaucratie excessive
    - Manque d'accès au financement et aux ressources financières
    - Résistance au changement au sein des organisations et des communautés
    - Difficultés à établir des partenariats et des collaborations efficaces
    - Autres (veuillez préciser) : _____

7. Imaginez que vous êtes impliqué dans un projet de recherche ou d'entrepreneuriat dans le domaine de l'agroalimentaire holistique. Selon vous, quelles solutions ou initiatives pourraient être mises en œuvre pour stimuler l'innovation, et comment développeriez-vous ce projet pour maximiser son potentiel d'innovation et son impact dans votre communauté ? (Sélectionnez jusqu'à 3 options)
    - Identifier les besoins et les défis spécifiques de la communauté
    - Collaboration interdisciplinaire : agrotechnologie, nutrition, durabilité et esprit d'entreprise
    - Mettre en œuvre des technologies émergentes telles que l'intelligence artificielle, les drones et les solutions basées sur les données.
    - Organiser des ateliers et des séminaires pour sensibiliser la communauté à l'importance de la durabilité dans l'agroalimentaire et aux avantages de l'innovation.
    - Établir des partenariats stratégiques avec les organisations locales, le gouvernement et les ONG
    - Autres : _____

III. Collaboration en matière d'innovation agroalimentaire holistique

Cette section vise à comprendre et à améliorer la collaboration entre les différentes parties prenantes afin de maximiser l'impact des innovations agroalimentaires.

8. Quels sont, selon vous, les principaux avantages d'une collaboration entre chercheurs, étudiants et entrepreneurs dans le domaine de l'innovation agroalimentaire holistique ? (Sélectionnez jusqu'à 3 options)
    - Accès à des connaissances et à une expertise diversifiées
    - Génération d'idées et de solutions innovantes grâce à la synergie de différentes perspectives
    - Accélération du transfert de technologie de la recherche vers l'industrie
    - Augmentation des possibilités de financement pour les projets d'innovation
    - Autres : _____

9. Quels sont les principaux obstacles ou contraintes rencontrés dans la collaboration entre les chercheurs, les étudiants et les entrepreneurs pour l'innovation dans l'agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?
    - Manque de communication et de coopération entre les différentes parties prenantes
    - Différences d'objectifs et de priorités entre les chercheurs, les étudiants et les entrepreneurs
    - Manque de ressources financières pour les initiatives d'innovation collaborative
    - Obstacles linguistiques ou culturels à la communication et à la compréhension mutuelle
    - Autres : _____

10. Comment pensez-vous que ces obstacles pourraient être surmontés pour faciliter la collaboration et l'innovation dans l'agroalimentaire holistique (réponse ouverte) ?

IV. Identification des besoins et des motivations pour l'innovation

Aidez-nous à mieux comprendre comment l'éducation et la formation à l'innovation peuvent favoriser l'émergence de nouveaux leaders dans l'agroalimentaire holistique.

11. Dans quelle mesure considérez-vous que l'éducation et la formation à l'innovation sont importantes pour les étudiants et les entrepreneurs dans le domaine de l'agroalimentaire holistique ? Veuillez

évaluer l'effet sur une échelle de 1 à 5 (1 - pas du tout important, 2 - sans importance, 3 - neutre, 4 - important, 5 - très important).

1 2 3 4 5

12. Quels sont les principaux obstacles ou contraintes auxquels les étudiants et les entrepreneurs agricoles sont confrontés pour devenir des innovateurs dans le domaine de l'agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?
    - o Manque d'accès aux ressources financières et technologiques pour développer et mettre en œuvre des innovations
    - o Bureaucratie et réglementation excessive dans le domaine agroalimentaire
    - o Manque de connaissances et d'expertise en matière d'innovation et de gestion de l'innovation
    - o Résistance au changement et esprit conservateur dans l'environnement agricole traditionnel
    - o Autres : _____

13. Comment pensez-vous que ces obstacles devraient être abordés pour soutenir les étudiants et les entrepreneurs dans le processus d'innovation dans l'agroalimentaire holistique (réponse ouverte) ?

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14. Imaginez que vous êtes un étudiant passionné par l'agriculture et que vous souhaitez développer une entreprise innovante dans le secteur agroalimentaire holistique. Quelles mesures prendriez-vous pour concrétiser votre idée et surmonter les obstacles potentiels (choisissez les trois premières mesures les plus importantes) ?
    - o Recherche et apprentissage approfondi des concepts et pratiques de l'agroalimentaire holistique.
    - o Élaboration d'un plan d'affaires détaillé comprenant des objectifs, des stratégies de mise en œuvre et des projections financières.
    - o Identifier et engager un mentor ou un consultant ayant de l'expérience dans l'agroalimentaire holistique pour recevoir des conseils et un soutien dans le processus de développement de l'entreprise.
    - o Développer des partenariats avec les agriculteurs locaux et les producteurs d'aliments biologiques afin de garantir une source stable de matières premières pour l'entreprise.
    - o Identifier les sources de financement, telles que les subventions de démarrage ou les prêts pour les jeunes entrepreneurs.

- Autres : _____

V. Identification des besoins et des possibilités de transformation des entreprises conventionnelles en entreprises agroalimentaires holistiques

Exprimez votre vision de la manière dont les entreprises traditionnelles peuvent être transformées pour répondre aux exigences de durabilité et d'innovation dans l'agroalimentaire.

15. Parmi les éléments suivants, quels sont ceux que vous considérez comme les principales possibilités de transformation des entreprises en entreprises agroalimentaires holistiques (sélectionnez jusqu'à 3 options) ?
    - Développement de produits alimentaires biologiques et sains
    - Mise en œuvre de pratiques agricoles durables et écologiques
    - Utilisation des technologies numériques et de l'IoT (Internet des objets) pour optimiser les processus agricoles.
    - Expansion des marchés et accès à des segments de consommateurs orientés vers les produits naturels et locaux
    - Autres : _____

16. Dans quelle mesure considérez-vous que la transformation des entreprises en entreprises agroalimentaires holistiques peut contribuer à accroître leur compétitivité et leur durabilité ? Veuillez évaluer l'effet sur une échelle de 1 à 5 (1 - pas d'effet, 2 - effet réduit, 3 - effet moyen, 4 - effet significatif, 5 - effet majeur).

    1 2 3 4 5

17. Quels sont les principaux obstacles ou contraintes que les entreprises rencontrent dans le processus de transformation en agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?
    - Coûts élevés liés à la mise en œuvre de pratiques agricoles durables et à la certification des produits biologiques
    - Manque d'accès aux ressources financières et aux investissements pour la modernisation des infrastructures et des technologies agricoles
    - Résistance au changement et manque d'expertise en matière d'agroalimentaire holistique
    - Obstacles législatifs et réglementaires à l'adoption de pratiques écologiques et de normes de qualité
    - Autres : _____

18. Comment pensez-vous que ces obstacles peuvent être surmontés pour faciliter le processus de transformation des entreprises en entreprises agroalimentaires holistiques (réponse ouverte) ?

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19. Imaginez que vous êtes un entrepreneur agricole qui souhaite transformer son entreprise traditionnelle en une entreprise axée sur l'agroalimentaire holistique. Quelles seraient les premières mesures que vous prendriez et quelles ressources ou quel soutien rechercheriez-vous pour y parvenir ? (Choisissez les trois premières étapes les plus importantes)
    - Évaluer l'état actuel de l'entreprise afin d'identifier les points forts et les domaines nécessitant des améliorations en vue de la transition vers un secteur agroalimentaire holistique.
    - Recherche et embauche d'un consultant ou d'un expert en agroalimentaire holistique pour fournir des conseils et une assistance dans le processus de transition.
    - Identifier et participer à des programmes de formation et à des séminaires dans le domaine de l'agroalimentaire holistique.
    - Élaborer un plan d'entreprise comprenant des objectifs clairs, des stratégies de marketing et des projections financières.
    - Identifier les sources potentielles de financement, telles que les subventions gouvernementales ou les prêts pour les entreprises agricoles.
    - Établir des partenariats avec les fournisseurs locaux et les organisations communautaires pour soutenir l'approvisionnement et la commercialisation de produits agroalimentaires holistiques.
    - Participer à des réseaux d'entreprises agricoles ou à des organisations professionnelles pour bénéficier du soutien et de l'expérience d'autres entrepreneurs agricoles qui ont déjà effectué la transition vers l'agroalimentaire holistique.
    - Autres : _____

VI. Identification des innovations ayant un potentiel de transformation

Discutons des innovations prometteuses dans le domaine de l'agroalimentaire holistique et de la manière dont elles peuvent devenir des entreprises prospères contribuant à un secteur plus dynamique et plus adaptable.

20. Parmi les innovations suivantes, quelles sont celles que vous considérez comme les plus prometteuses et susceptibles de se transformer en entreprises en pleine croissance dans le domaine de l'agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?

- Utilisation des technologies blockchain pour le suivi des chaînes d'approvisionnement et l'authentification des produits alimentaires biologiques.
- Développement d'aliments alternatifs tels que les hamburgers végétaux ou les substituts de viande à base de plantes
- Mise en œuvre de systèmes d'agriculture urbaine et de production alimentaire locale dans les villes
- Utilisation de l'intelligence artificielle et des robots dans les processus agricoles pour optimiser le rendement et réduire les coûts
- Autres : _____

21. Quels sont les principaux obstacles ou contraintes que rencontrent les innovations pour se transformer en entreprises prospères dans le domaine de l'agroalimentaire holistique (sélectionnez jusqu'à 3 options) ?
    - Manque de capital d'investissement et de financement pour le développement et l'extension des innovations
    - Obstacles réglementaires et bureaucratiques à l'introduction d'innovations sur le marché
    - Résistance des consommateurs ou des producteurs traditionnels à l'adoption de nouvelles technologies ou de nouveaux produits
    - La nécessité d'éduquer et d'informer le marché sur les avantages des innovations
    - Autres : _____

22. Imaginez que vous participiez au développement d'une innovation dans le domaine de l'agroalimentaire holistique, telle qu'une nouvelle technologie de transformation des aliments biologiques. Quelles stratégies et tactiques mettriez-vous en œuvre pour vous assurer que votre innovation se transforme avec succès en une entreprise en pleine croissance et qu'elle soit acceptée par le marché ? (Sélectionnez jusqu'à 3 options)
    - Identifier les besoins du marché et les lacunes technologiques afin de développer une solution valable
    - Collaboration étroite avec des experts dans le domaine agroalimentaire pour une mise en œuvre efficace
    - Tests et ajustements continus sur la base du retour d'information des clients
    - Établir des partenariats stratégiques pour une source stable de matières premières et une distribution efficace
    - Élaborer un plan d'entreprise solide comprenant des analyses financières détaillées et des projections réalistes.
    - Développer les infrastructures et les capacités de production pour répondre à la demande croissante

- Mettre en œuvre un programme de formation et d'éducation pour promouvoir l'utilisation de la technologie
- Autres : _____

Questions finales : Profil

Cette dernière partie est essentielle pour garantir que notre analyse des données reflète les diverses perspectives et expériences des participants à cette étude.

a. Quelle est l'activité principale de votre entreprise ?

- Production agricole (céréales et autres grandes cultures, bétail, volaille, abeilles, aquaculture, légumes, fruits, etc.)
- Transformation de produits agricoles - ateliers et usines de transformation du lait, de la viande, des légumes et des fruits.
- Commerce et autres services (magasins, restaurants, auberges, etc.)
- Autre : _____

b. Depuis combien de temps exploitez-vous cette entreprise ? (années)

_____

c. Quel est le chiffre d'affaires en 2023 (en dollars) ?

_____

d. Quel est votre sexe ? (Veuillez cocher la réponse appropriée ou remplir les blancs si les options présentées ne reflètent pas votre identité de genre).

- Femme
- Homme
- Préfère ne pas répondre
- Autre (veuillez préciser) : _____

e. Veuillez préciser votre âge. Cette information nous aidera à mieux comprendre l'impact de l'expérience par rapport aux thèmes de ce questionnaire. Votre âge : _____ (années)

f. Quel est le niveau d'études le plus élevé que vous ayez atteint ? (Ne sélectionnez pas plus d'une option)

- Primaire
- Secondaire
- Université
- Troisième cycle
- Autre (veuillez préciser) : _____

Nous vous remercions de votre contribution à cette étude. Votre avis est essentiel pour comprendre le potentiel d'innovation et de croissance du secteur agroalimentaire global.

Projet CHAIN

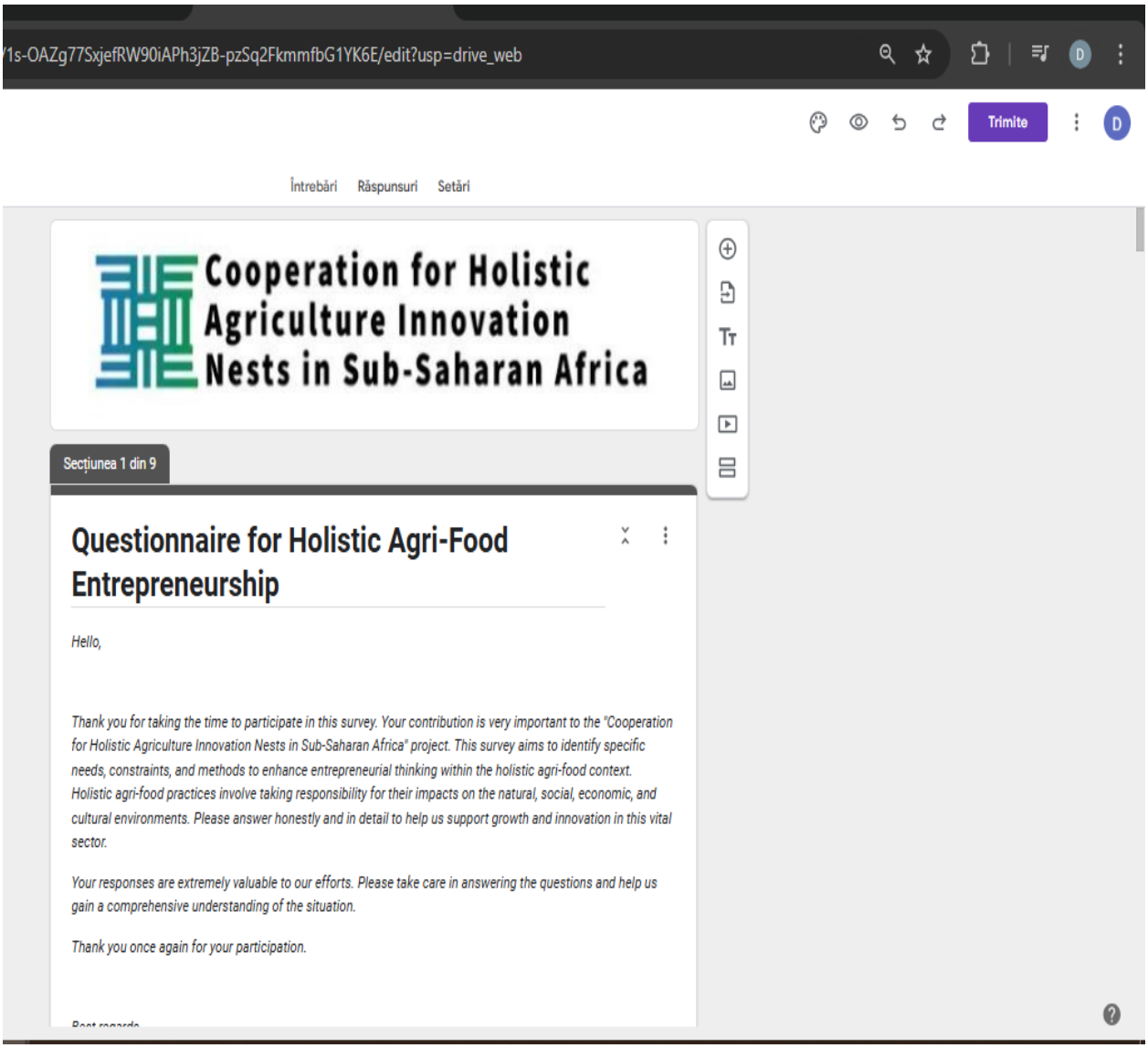
La coopération pour l'innovation en matière d'agriculture holistique fait son nid en Afrique subsaharienne

Projet Erasmus+ CBHE CHAIN - 101082963

Co-funded by the European Union

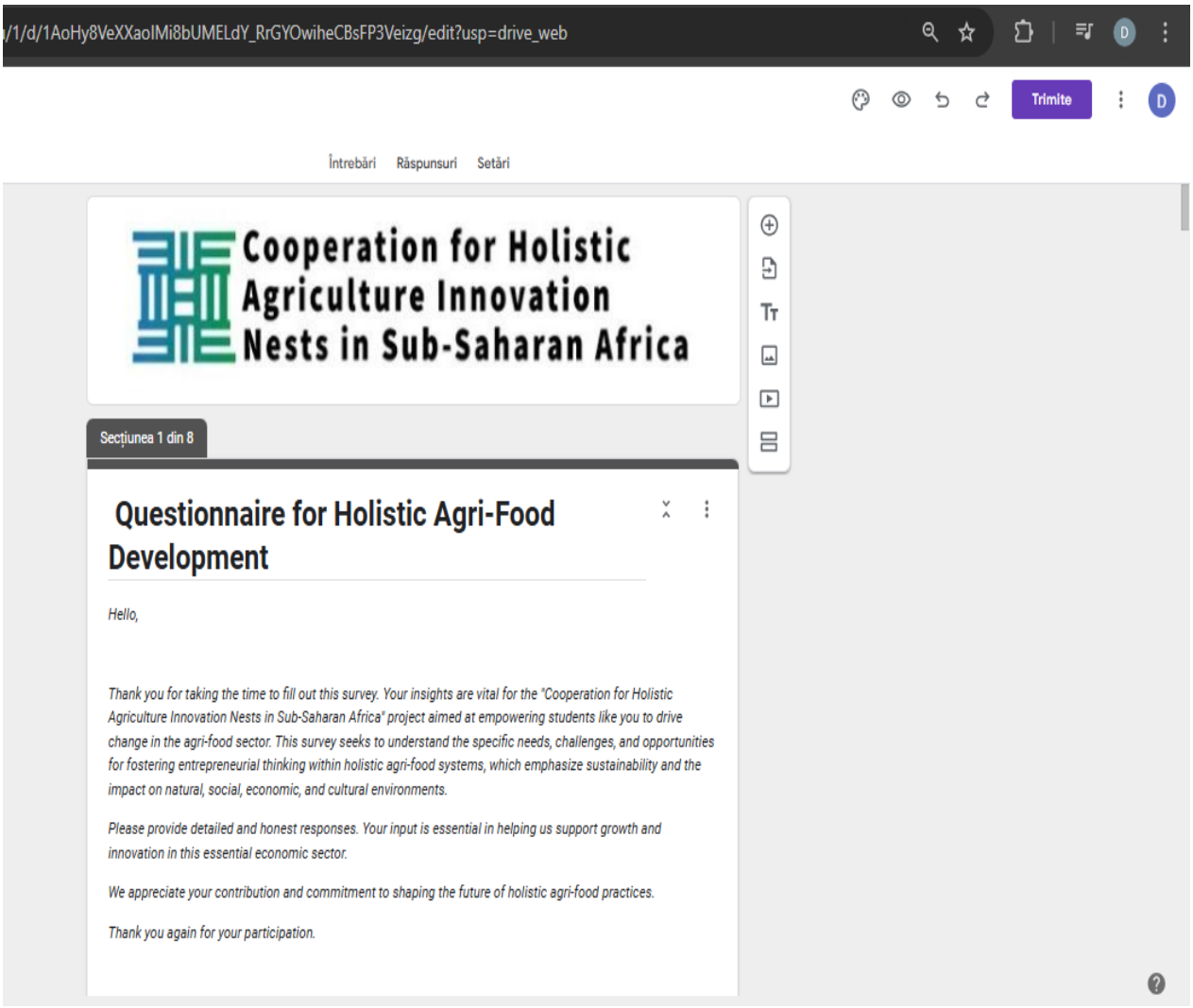
Anexa n° 2

Exemplu de chestionar online pentru antreprenori



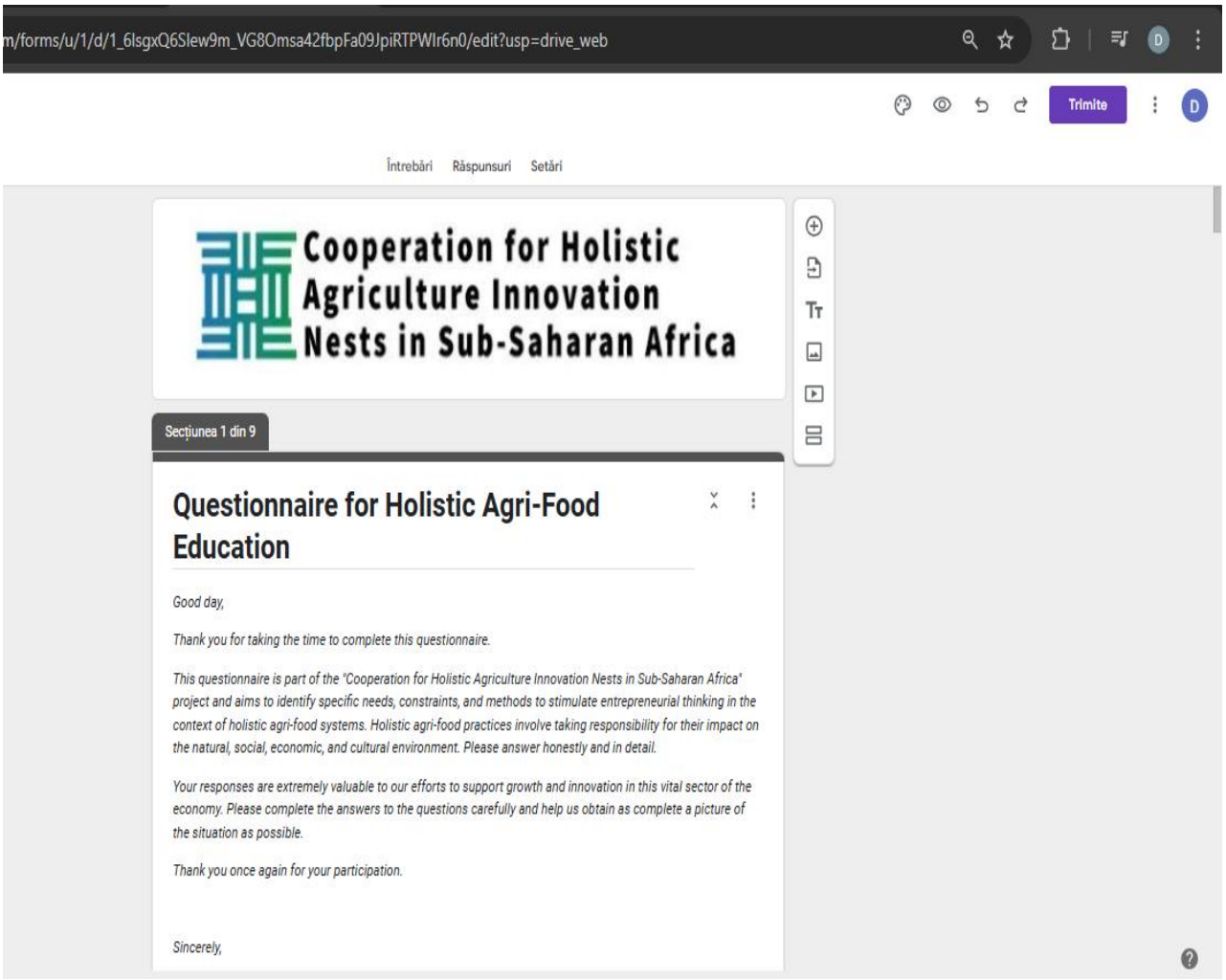
Anexa n° 3

Exemple de gestion en ligne pour les étudiants



Anexa n° 4

Exemple de gestion en ligne pour les professionnels et les enseignants



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I. Identification of Needs, Constraints, and Methods for Stimulating Entrepreneurial Thinking

Explore the main forces and challenges shaping entrepreneurial thinking in the holistic agri-food field and contribute to creating solutions tailored to your needs.

1. What do you consider the most important factors and main challenges that stimulate entrepreneurial thinking in the holistic agri-food field? Please select up to three options and add any other challenges you encounter. *

- [ ] Access to financing and financial resources
- [ ] Education and training in entrepreneurial skills specialized in holistic agri-food
- [ ] Access to mentorship and advice from field experts
- [ ] Development of support networks among entrepreneurs in the holistic agri-food field
- [ ] Altele: _____

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 holistic agri-food
- [ ] Lack/scarcity of human resources
- [ ] Difficulties in accessing markets for innovative agri-food products
- [ ] Altele: _____

3. What methods do you consider most effective in stimulating entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options) *

- [ ] Organizing mentorship programs and internships in companies within the holistic agri-food industry
- [ ] Facilitating access to financing and startup resources for entrepreneurs in the holistic agri-food field
- [ ] Developing educational and training programs in entrepreneurship tailored specifically to the holistic agri-food field
- [ ] Creating hubs and innovation centers in holistic agri-food to stimulate collaboration and innovation
- [ ] Altele: _____

4. What do you think the government or educational institutions should do to stimulate entrepreneurial thinking in the holistic agri-food field? (Select up to 3 options) *

- [ ] Implementing educational programs in entrepreneurship specialized in holistic agri-food in schools and universities, focusing on developing skills in critical thinking, innovation, and business management.
- [ ] Developing mentorship programs and business incubators specialized in holistic agri-food that 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.
- [ ] Implementing support programs for innovation and startups in holistic agri-food through grants, tax facilities, and access to research infrastructure and resources.

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6. What do you think are the main obstacles to innovation in holistic agri-food? (Select up to 3 options) *

- [ ] Regulatory conditions and excessive bureaucracy
- [ ] Lack of access to financing and financial resources
- [ ] Resistance to change within organizations and communities
- [ ] Difficulties in establishing effective partnerships and collaborations
- [ ] Altele: _____

7. Please imagine you are involved in a research or entrepreneurship project in holistic agri-food. What solutions or initiatives do you think could be implemented to stimulate innovation, and how would you develop this project to maximize its innovation potential and impact in 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 organizations, government, and NGOs
- [ ] Altele: _____

Înapoi Înainte Golește formularul

Nu trimiteți parole prin formularele Google.

elYzPKOgLaR3INC86OItkymBDBHcJ9gwfTVtgfqDFI0IQ/formResponse

8. Which of the following do you consider could be the main benefits of collaboration among 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
- [ ] Altele: _____

9. What are the main obstacles or constraints encountered in collaboration among researchers, students, and entrepreneurs for innovation in holistic agri-food? (Select up to 3 options) *

- [ ] Lack of communication and cooperation among different stakeholders
- [ ] Differences in objectives and priorities among researchers, students, and entrepreneurs
- [ ] Lack of financial resources for collaborative innovation initiatives
- [ ] Language or cultural barriers in communication and mutual understanding
- [ ] Altele: _____

10. How do you think these obstacles could be overcome to facilitate collaboration and innovation in holistic agri-food? (Open response) *

Răspunsul tău

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 recueillies 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 : .....

Annexe n° 6

Modèle de matrice pour les sessions de groupes de discussion

Participants	**Objectifs**					
	1	**2**	**3**	**4**	**5**	**6**
Universités et instituts de recherche						
Producteurs et agriculteurs						
Représentants des consommateurs						
Entreprises de la chaîne d'approvisionnement alimentaire						
Investisseurs et fonds d'investissement						
Organisations internationales						
Église						
Institutions culturelles						
Banques						
Gouvernement						

ONG-uri :						

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

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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

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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.” Stephene. 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 (JOOUST) 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°05'38.0"S, 34°15'31.0"E (Latitude: -0.093889; Longitude:34.258611).

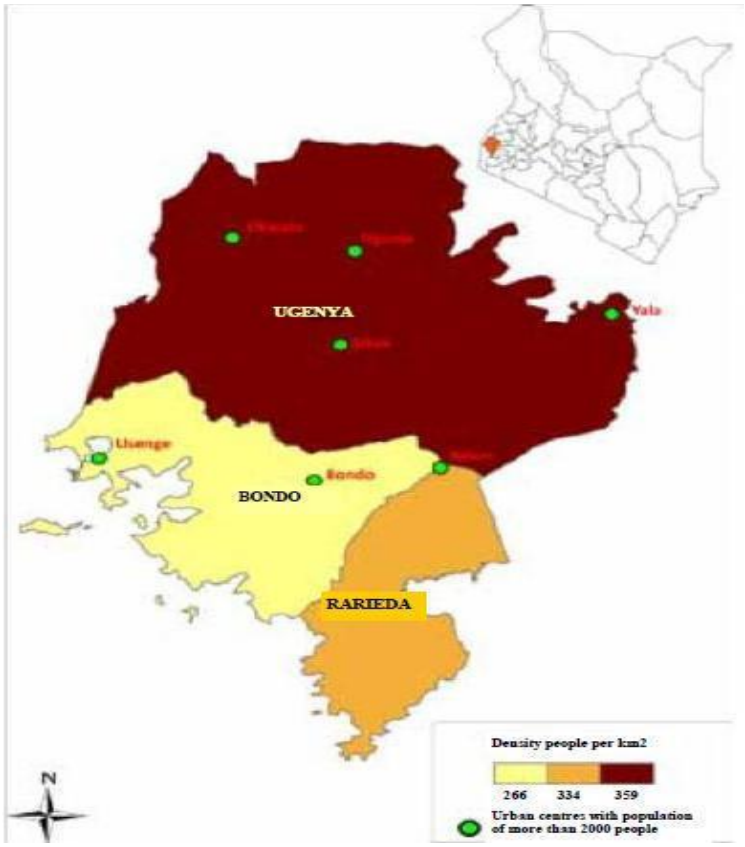

Figure 1: Map of study area: Bondo Sub- County, Siaya County-Kenya

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.) Flocponic 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 Flocponic 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.

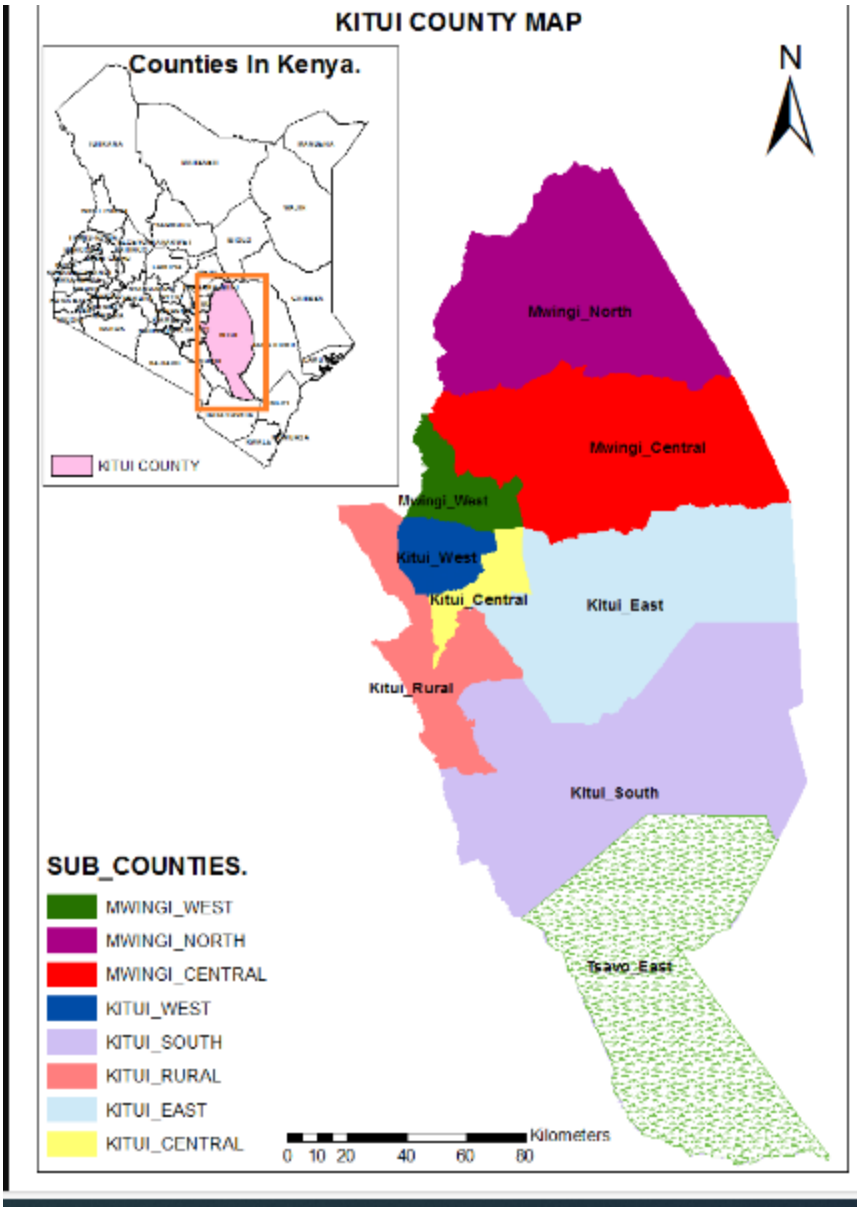

Figure 2: Map of study area: Kwa Vonza-Kitui County in Kenya

***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.

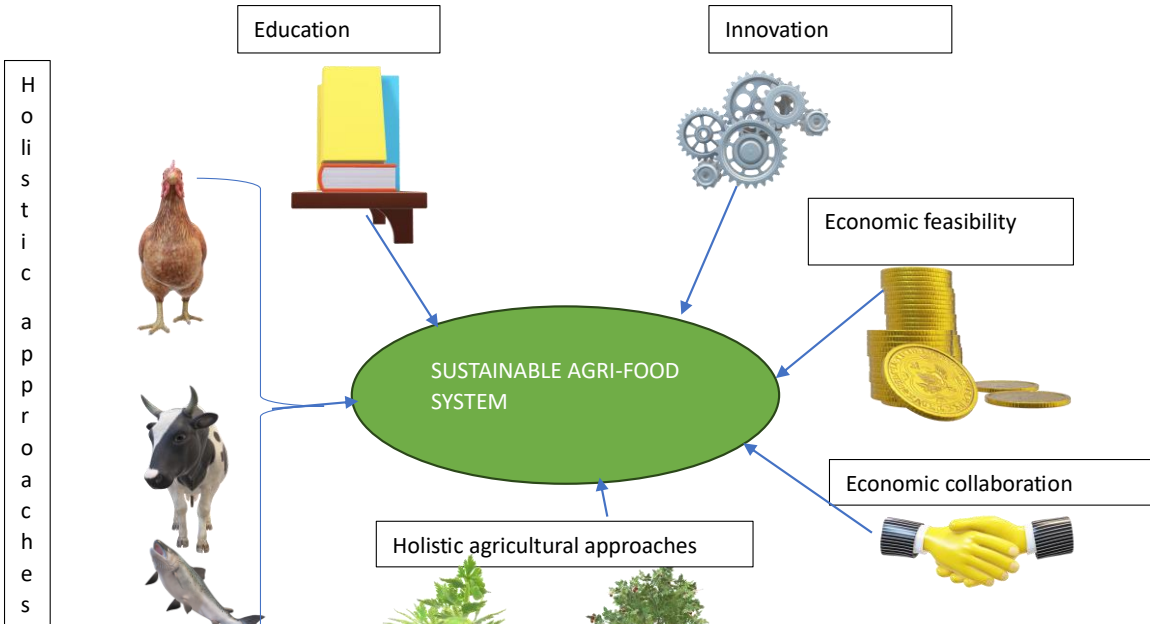

Figure 3: sustainable agri-food system cycle

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.

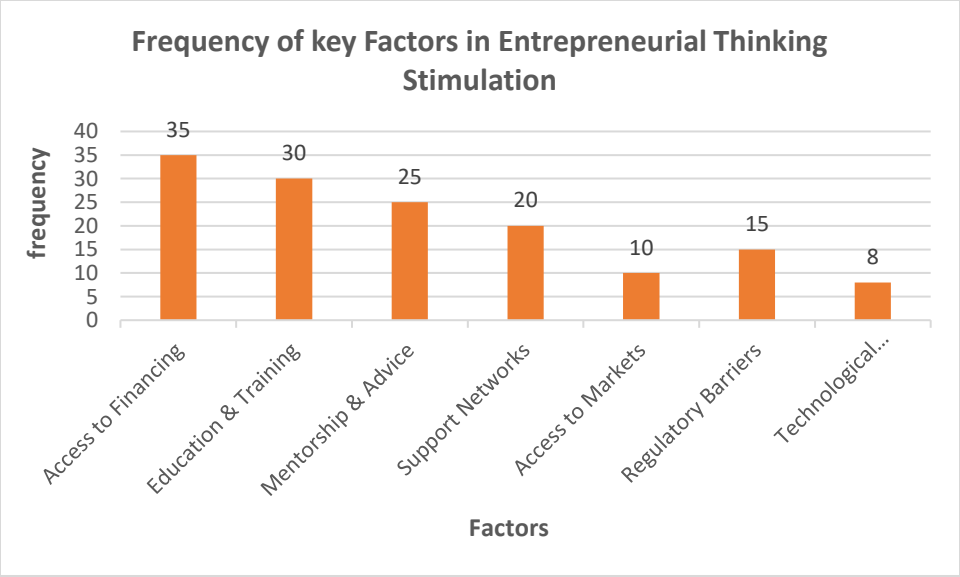

Figure 4: Frequency of key factors in entrepreneurial thinking stimulation

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”.

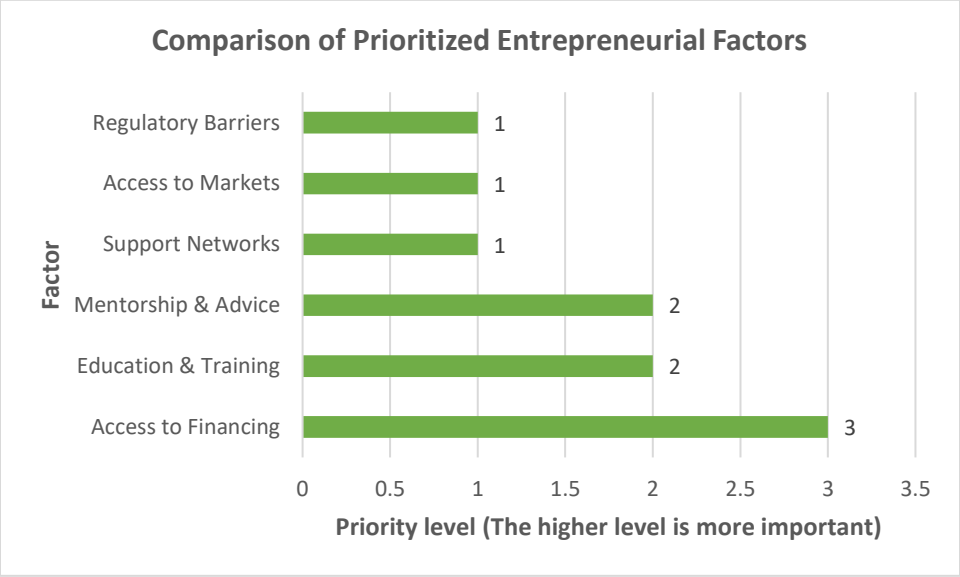

Figure 5: Comparison of prioritized entrepreneurial factors

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 significancy in the entrepreneurial thinking stimulation in holistic agri-food sector.

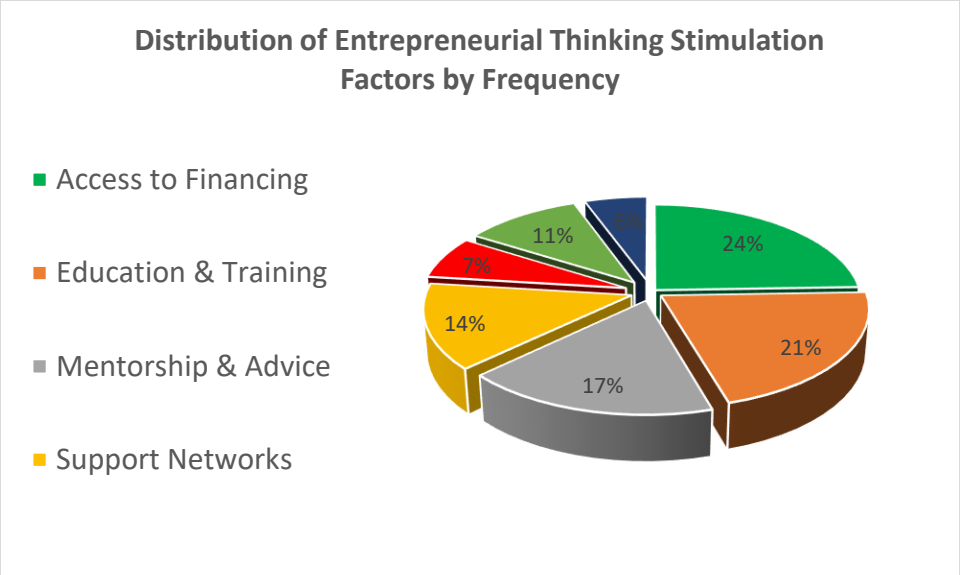

Figure 6: Distribution of entrepreneurial thinking stimulation factors by frequency

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.

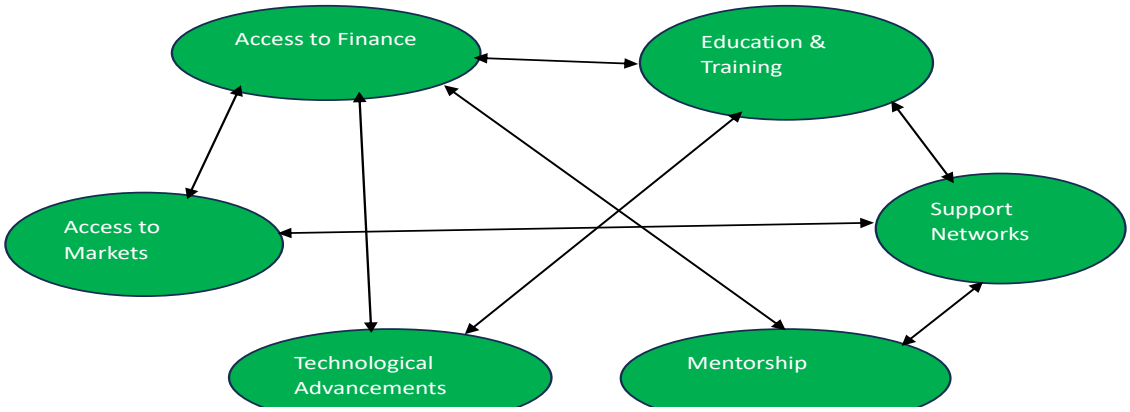

Figure 7: Networks in the Holistic Agri-Food Entrepreneurial Ecosystem

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

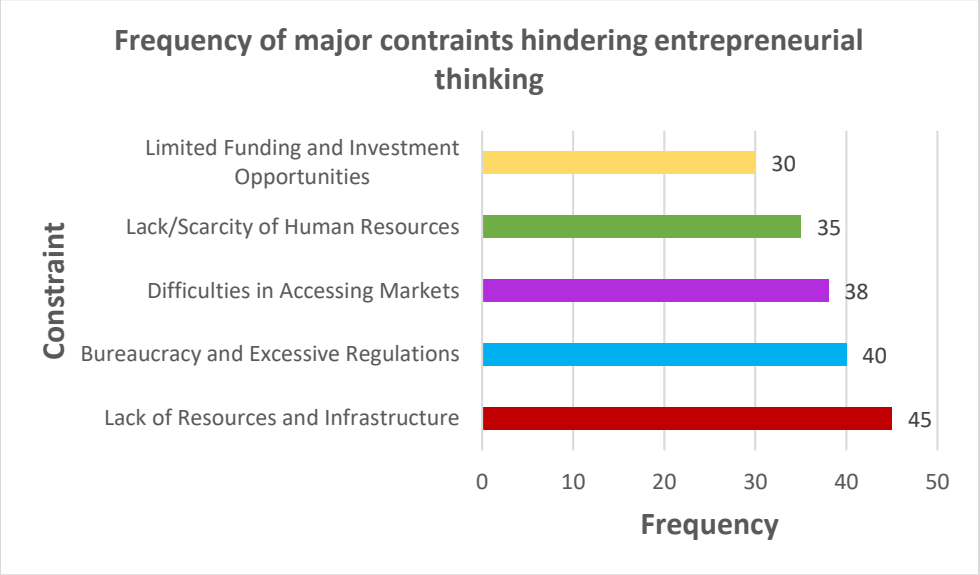

Figure 8: Frequency of major constraints hindering entrepreneurial thinking

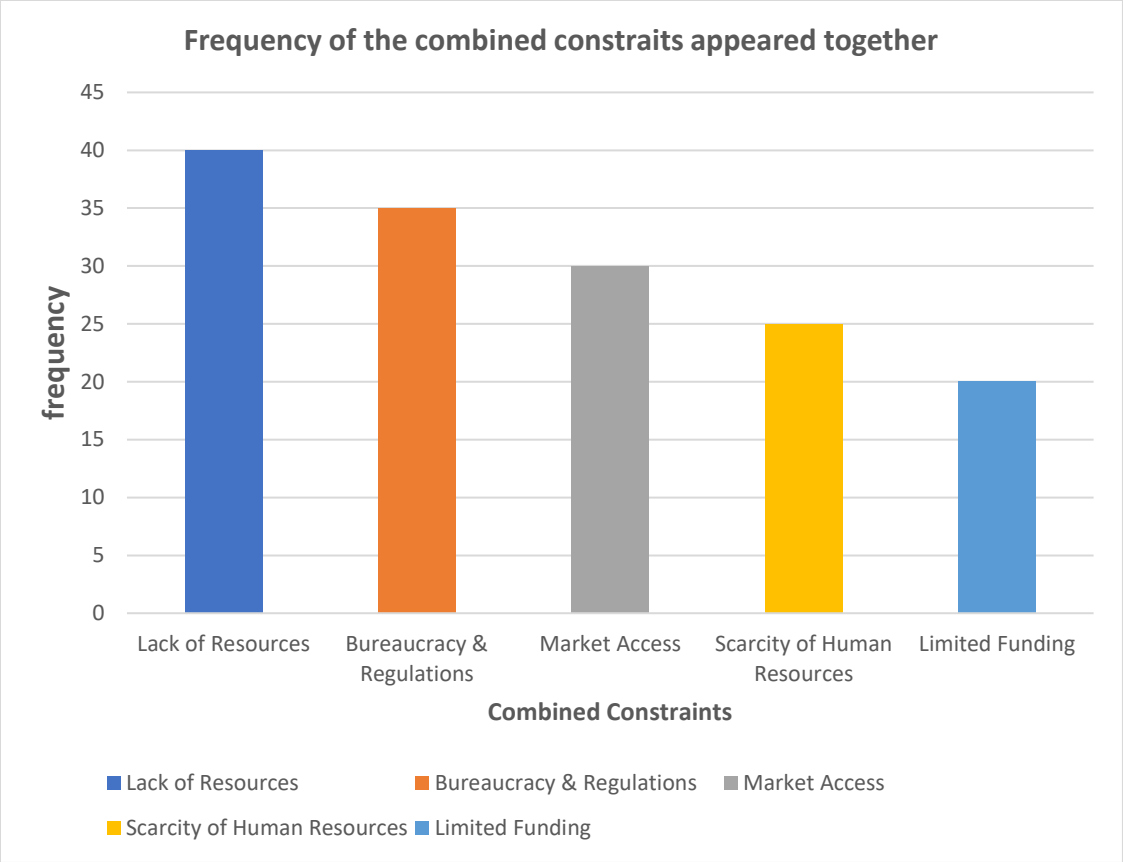

Figure 9: Frequency of combined constraints appeared together

The illustrations above indicate major constrains encountered while developing entrepreneurial thinking in holistic agri-food system. According to the study, Lack of access to adequate resources is a more recurred 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 s 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

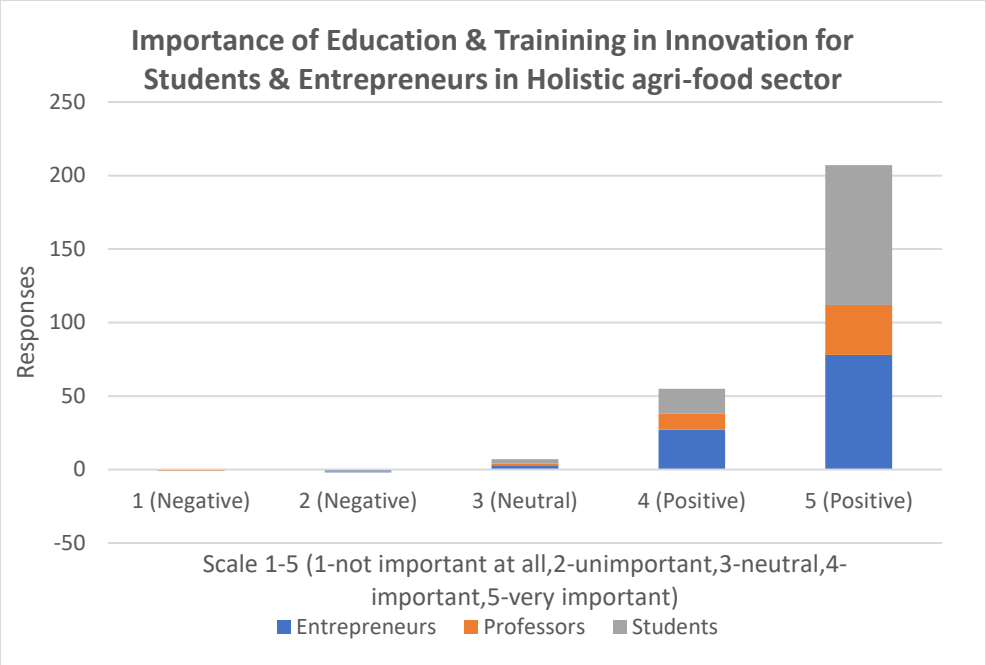

Figure 10: Importance of education and training in innovation for students and entrepreneurs in holistic agri-food sector

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 and consumers` 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.

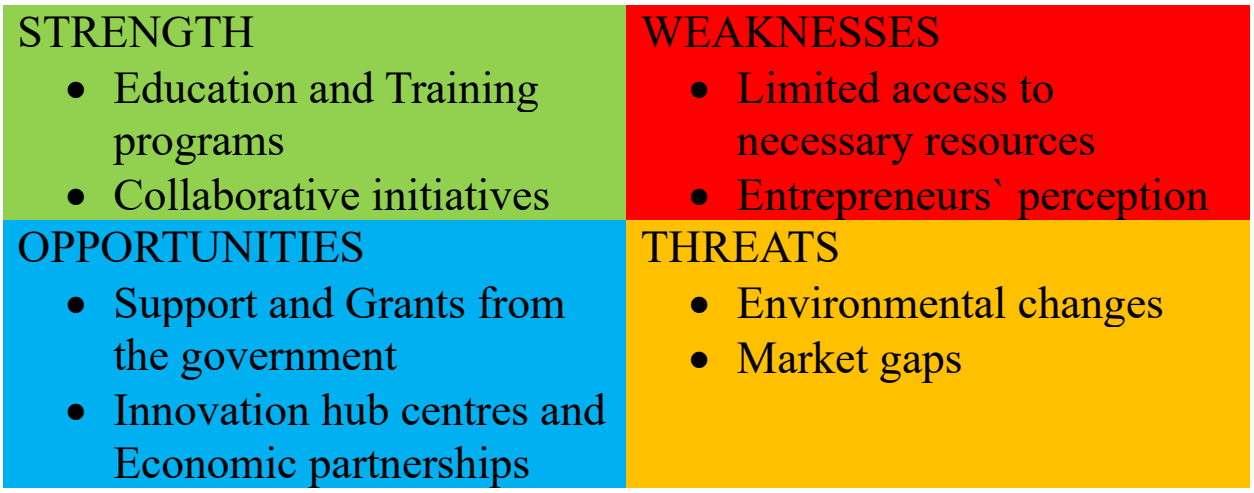

Figure 11: SWOT Matrix for Developing a Sustainable Agri-Food system

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 recurred 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 is ……..and 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.

Synthetic notes

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)

Synthetic notes

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.

Debrifing-ul echipei de intervievatori 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

Subject name ……	Interview form number ……
The field of expertise ……	Female ☐ Male ☐

INTERVIEW GUIDE*
for teachers

Interviewer name ……	Date ……..

Thank you for taking the time to speak with us today.
Our name is ……..and 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 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.

Debrifing-ul echipei de intervievatori 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?

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

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.

Debrifing-ul echipei de intervievatori 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)

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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.*

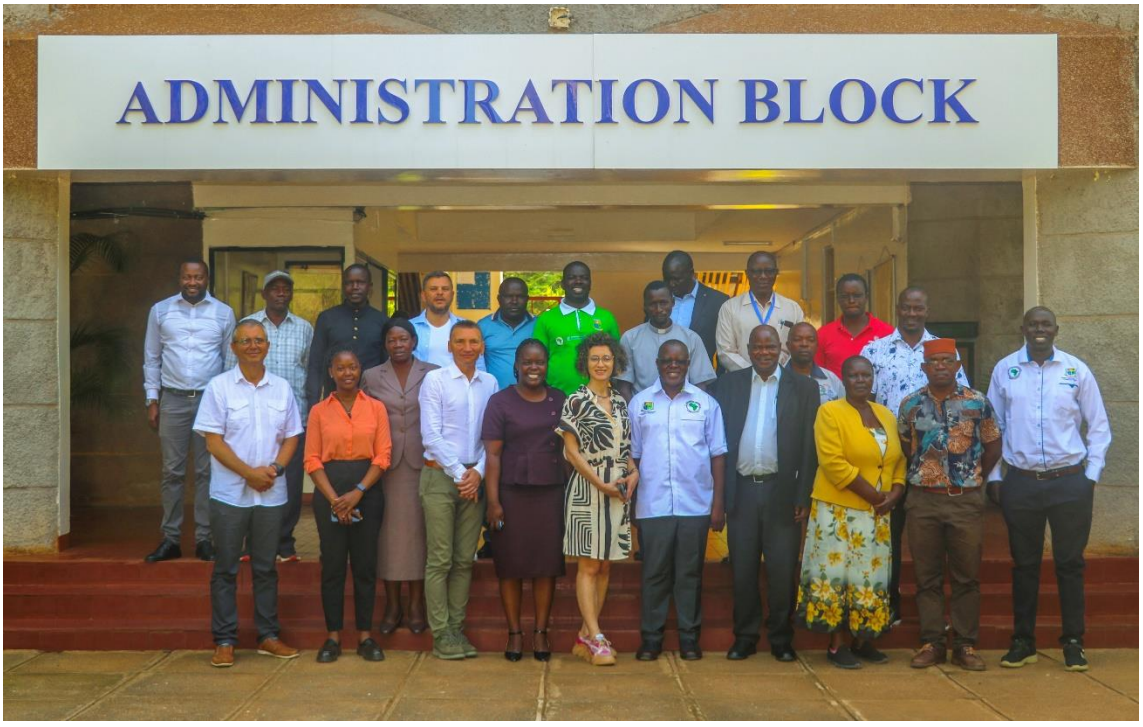
Poultry unit, *captured by Brenda.*

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.*