

Research Application Summary

Improvement of Indigenous Coping Strategies of Famine-stricken areas in Darfur State, Sudan

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Abstract

The project scientific team held a series of meetings, validating the project work plan and setting up the appropriate criteria (academic performance, research proposals, and interviews) for the selection of the MSc candidates. Eighty nine applications were received, reviewed and short-listed, and the most potential 12 candidates were chosen and successfully registered as MSc students. The 12 proposed research topics are complementary and were revised and designed to identify and promote indigenous famine survival strategies and to provide applicable and accessible solutions using indigenous and advanced knowledge and scientific methodologies and technological innovations. The topics covered: i) enhancement of production-process of traditional famine-foods, ii) improvement of the quality, nutritive value and safety of the famine foods, iii) optimization of the storage conditions and packaging systems at the villages level for long shelf-life of the indigenous fermented foods as well as iv) identification and exploration of new famine-foods that are available but not yet been properly investigated and utilized. Sufficient indigenous knowledge of the traditional famine-food preparation and availability in North Darfur has been collected, which had helped to create more awareness about indigenous famine-foods, and founded a strong base-line for designing the relevant laboratory experiments. In a series of preparatory and training workshops, the students have been sensitized and well-trained on different concepts of conducting field surveys and the method of data collection. These training workshops have significantly helped in building and raising the capacity of the students to be able to collect accurate and reliable data and information on the topics of concern. At present, all students are on ground conducting the field surveys, collecting indigenous knowledge and traditional-prepared famine-food samples, for further laboratory analysis. During the started process of the project implementation linkages and partnership have been established with many stakeholders and that will facilitate the project implementation process, and build and strengthen national advocacy coalitions for supporting the development of indigenous famine survival strategies to help people become resilient to famine-stricken in the future.

Keywords: Darfur, famine coping strategies, Indigenous Knowledge, Sudan, tradition foods

Résumé

L'équipe scientifique du projet a tenu une série de réunions, validant le plan de travail du projet et établissant les critères appropriés (performance académique, propositions de recherche et entretiens) pour la sélection des candidats pour la maîtrise. Quarante-neuf candidatures étaient reçues,

examinées et présélectionnées, et les 12 candidats les plus potentiels étaient choisis et inscrits avec succès en tant qu'étudiants en maîtrise. Les 12 sujets de recherche proposés sont complémentaires et ont été révisés et conçus pour identifier et promouvoir des stratégies autochtones de la survie à la famine et pour fournir des solutions applicables et accessibles en utilisant des connaissances autochtones et avancées, des méthodologies scientifiques et des innovations technologiques. Les sujets couverts englobaient: i) l'amélioration du processus de production des aliments de famine traditionnels, ii) amélioration de la qualité, de la valeur nutritive et de la sécurité des aliments de famine, iii) optimisation des conditions de stockage et des systèmes d'emballage au niveau des villages pour une longue durée de conservation des aliments fermentés indigènes, iv) l'identification et l'exploration de nouveaux aliments de famine qui sont disponibles mais qui n'ont pas encore été correctement étudiés et utilisés. Des connaissances indigènes suffisantes sur la préparation et la disponibilité traditionnelles des aliments de famine dans le nord du Darfour ont été recueillies, ce qui a contribué à mieux faire connaître les aliments de famine indigènes et a établi une base solide pour la conception des expériences de laboratoire pertinentes. Dans une série d'ateliers préparatoires et de formation, les étudiants ont été sensibilisés et bien formés sur différents concepts de conduite d'enquêtes de terrain et la méthode de collecte de données. Ces ateliers de formation ont considérablement contribué à renforcer et à accroître la capacité des étudiants à collecter des données et des informations précises et fiables sur les sujets d'intérêt. Actuellement, tous les étudiants sont en train de mener des enquêtes sur le terrain, collecter des données sur les connaissances indigènes et des échantillons d'aliments de famine préparés de manière traditionnelle, pour une analyse plus approfondie en laboratoire. Au cours du processus de démarrage de la mise en œuvre du projet, des liens et des partenariats ont été établis avec de nombreuses parties prenantes, ce qui facilitera le processus de mise en œuvre du projet, et construira et renforcera des coalitions nationales de plaidoyer pour soutenir le développement de stratégies indigènes de survie à la famine afin d'aider les populations à devenir résilients aux menaces de la famine à l'avenir.

Mots clés : Darfour, stratégies d'adaptation à la famine, connaissance indigène, Soudan, aliments traditionnels

Introduction

Famine is occurring in various parts of Africa. North of the equator the whole Sahel region is at risk but actual famine is taking place in Liberia, Sudan and Somalia (Samuel, 2007). There are three main causes: war, failure of rain, a malfunction of traditional agricultural plantings and the use of land in order to export crops instead of food for the country (Chris, 2018). The 1990-1991 famine, as in the period 1984 to 1985, is part of the gradual desertification process, which is a long-term problem of survival in the most affected areas of North Darfur and resulted in a virtually non-existent agricultural production in North Darfur and low in South Darfur, a considerable increase in the price of cereals on the market, the abandonment of "commercial" crops (groundnuts, sesame, etc.), the 30-40% loss of livestock in North Darfur, important water supply problems with the drying up of the hafir, high rates of malnutrition (Catherine, 1993).

The consequences on Darfur due to the Darfur Crisis, the violence and the mass migrations are also many and varied. The majority of the effects are, however, social. Over 1 million people are suffering from starvation, disease and malnutrition. Fermentation can be used to ferment grains, legumes, vegetables, and other foods. All of these foods, when fermented traditionally, come out more nutritious than their regular state. For example, fermented dairy has been shown to have a higher level of folate, pyridoxine, B vitamins, riboflavin, and biotin than milk alone (Fermentools, 2018).

Although fermentation is being practiced in Darfur to preserve and improve the nutritive value of foods in a traditional ways, but the indigenous fermented foods is not yet scaled-out to fill the food-gaps during the repeated happened famine-stricken in the areas of great Darfur. These could be related to the following reasons; i) it is very challengeable for the poor and displaced households to produce/prepare adequate quantities of these fermented foods traditionally, ii) lack of proper storage facilities and packaging systems at the villages level iii) short shelf-life of the end products of the fermented foods, and iv) the assurance of high safety aspects of these traditionally prepared fermented foods after long period of time. There is a lack of knowledge and information in these aspects. The ongoing project is design to contribute in addressing the above mentioned challenges and constraints and providing applicable and accessible solutions using indigenous and advanced knowledge and scientific methodologies and technological innovations. The project focusing on selecting and using efficient microbial strains to fast-track the fermentation process, improving the quality, nutritive value, safety and shelf-life of the indigenous fermented foods in Darfur to help people become resilient to famine-stricken. Based on the fact that Darfur is rich in both flora and fauna some of which has not yet been utilized, the project is also identifying and exploring new famine-foods that are available but not yet been properly investigated as well as is promoting the utilization of these untapped sources of famine foods.

The overall objective of this project is to identify and promote indigenous famine survival strategies based on native foods; plants, crops, fruits in Darfur state using local knowledge and advanced biotechnological approaches. The specific objectives of the project are: (i) To stand on the socioeconomic characteristics of famine-stricken people in Darfur states; (ii) To document and perform in-depth botanical and ecological studies of the wild edible plants fruits, grass, root consumed of times of famine before international relief reach the area of famine; (iii) To assess the traditional habits of the consumption of the famine foods, whether it is reasonably suitable, traditional, extremely traditional etc. and people willingness to adopt other recommended ways; (iv) To collect data about indigenous and to perform scientifically-based analysis of nutritive value and preservation of each of these foods., and how to improve their knowledge in this concern; (v) To raise the individual capacities to adopt livelihood coping strategies under famine situation; (vi) To strongly engage gender in the whole process from assessing traditional habits of consumption to transition to sustainability; (vii) To recommend the suitable indigenous fermentation processes to add value and improve storage techniques of these foods for prolonging shelf line; and (viii) To establish Famine Early Warning Network and practices to inform programming and decision-making

Process of Students Selection: The steering scientific committee of the project composed of 5 staff members from the department of Agric. Biotechnology, Agric. Extension Rural Development and Institute of Desertification Studies was entrusted with the selection process. The committee held several meetings to set out the selection criteria. Following the announcement, selection was based on two stages: Stage one: after receiving all applications (89 candidates), a short list containing 24 applicants was prepared by the committee based on three criteria: University of graduation, department of graduation (specialization) and degree of graduation. Different points were assigned to each in a scale of 1 – 10. Stage two: the short-listed applicants were asked to attend an interview by the committee. The criteria were: language and communication (English being the medium of instruction in the project), methodology and concept of the research proposal. Points were assigned to the criteria on a scale of 1 – 10. Based on these interviews a final list of 12 candidates was selected as eligible candidates, of them 9 are female. Every one of the 12 candidates was asked to submit a relevant research proposal.

Project Description:The 12 approved research topics are complementary and were revised and designed to identify and promote indigenous famine survival strategies and to provide applicable and accessible solutions using indigenous and advanced knowledge and scientific methodologies

and technological innovations. The research topics covered: i) understanding the socio-economic characteristics of the population of the study area and the indigenous practices, attitudes and survival strategies of the families and households to cope with famines, ii) production of adequate quantities of traditional famine-foods by identifying, selecting and using efficient microbial strains to fast-track the fermentation process, iii) improvement of the quality, nutritive value and safety of the famine foods through proper fermentation and combatable additives, iv) optimization of the storage conditions and packaging systems at the villages level for long shelf-life and preservation of the indigenous fermented or unfermented foods (studying the effect of drying and storage technologies and containers, packaging system and storage temperature) v) assuring of high safety aspects of these traditionally prepared fermented or unfermented foods after long period of storage time as well as vi) identification and exploration of new famine-foods (untapped sources of famine foods) that are available but not yet been properly investigated and utilized (e.g. root and tuber crops, wild rice and grass, non-wood forest product). Each of the 12 M.Sc. students presented and discussed his research proposal in one-hour seminar, with the project scientific team and a number of the other relevant scientists of the Faculty, received feedbacks and valuable inputs that improved the quality and filled the gaps of proposed research.

Project Implementation

Training of candidates. The committee of the project has held four training workshops within which the students have been trained on methods of data collection; primary and secondary data. How to search and access secondary data sources, how to cite, quote and acknowledge the references. To collect primary data, students had been trained on the different sampling methods; probability sampling methods (simple random sampling, systematic, stratified and multi-stratified random sampling cluster sampling etc. and non-probability sampling methods (quota sampling, convenient sampling, target sampling method, snow ball sampling methods etc.). In addition, students have been trained on questionnaire design to attain, through the social survey, the most relevant socio-economic data required for fulfilling the objectives of the research project.. In addition to that the students are subjected to training on how to collect material samples, each in his/her specific study, including; plant samples, indigenous food samples, fermented and dried food samples, non-wood forest product samples etc. A thorough discussion took place to make sure that the candidates have grasped well how to implement the different concepts in the field work. The students were requested to design their questionnaire for field data collection they all did, presented their materials and comprehensively discussed by the attendants (Professors, supervisors, students) to assure that the questions were prepared to answer the objectives of the research, which are expected to be stated in SMART method.

Field work. At present all candidates travelled to the area of the study (North Darfur state). Each candidate is in process of collecting the most relevant necessary data and sample to carry out his or her research bearing in mind all researchers should be accomplished in a complementally process. Interviews, group discussions and meetings key informants are being carried out to attain a valid reliable data concerning each topic.

Laboratory Analysis. Students, who are working on alternatives of famine foods, with involvement of the locals, collected the material samples to undertake the chemical and other necessary analysis of their materials using the methods of analysis that formerly determined. The nutritive value and chemical composition of the collected samples will be analyzed using standard methods and procedures of AOAC (2016). Main focus will be on determining the percentages and quantities of carbohydrate, starch, minerals, vitamins, calcium, phosphorus, fibers etc. of the products, as well as microorganisms will be isolated from fermented foods according to the method as described by

Schillinger and Lucke (1987).

Results

The activities carried out during the last quarter (mid July – mid October 2019) will contribute to the following objectives of the project:

Indigenous knowledge collection. During research proposal writing and presentation, all 12 M.Sc. students fully engaged in in-depth literature review and reading on the indigenous famine foods and coping strategies in Darfur. The students also positively interacted with, and have received constrictive feedbacks, corrections and guidance from the project scientific team and other relevant scientists. This has resulted in collection of sufficient indigenous knowledge of the traditional famine-food preparation in North Darfur and its availability, which had helped to create more awareness about indigenous famine-foods in Darfur, and founded a strong base-line for designing the relevant laboratory experiments, and developing and promoting indigenous famine survival strategies to help people become resilient to famine-stricken in the future.

Sensitization and training workshops. In a series of preparatory and training workshops conducted at the Faculty of Agriculture, UofK, August – September 2019, the 12 M.Sc. students have been sensitized and well-trained on different concepts of conducting field surveys, the method of collecting a reliable data, sampling techniques and sample collection, questionnaires designing and filling, group discussion and face-to-face interviews with households, local community leaders and key informants in the area of the study. These training workshops have significantly helped in building and raising the capacity of the student to be able to collect accurate and reliable data and information on the topics of concern.

Field surveys and famine-food samples collection, and engagement of the local communities. At present, all students are on ground conducting the field surveys, collecting indigenous knowledge and traditional-prepared (fermented) famine-food samples and other new sources of potential famine-foods samples, for further laboratory analysis and investigations including: nutritive value, shelf-life, safety, storage, etc. They are all actively interacting with, and collecting the necessary data from, farmers, households, local community leaders, officials, key informants, local market traders and relief NGOs in Darfur, to ensure full engagement of the communities. For more validation of data, students carried out group discussions with target communities and interviewed the key informants in the studied areas. Every one of the 12 MSc students is targeting for the field surveys and questionnaire, a sample size of the population of 120 to 150 individuals (farmers, households, local community leaders, officials, key informants, local market traders etc.), In total about 1500 – 1800 households will be directly engaged in this project, which is expected to directly impact around 10500 – 12600 people of the project communities. Taking into consideration the fact that most of them (80%) will be women (gender) based on the culture of the Darfurian, thus gender engagement is strongly assured during this project.

Establishment of partnership. During the started process of the project implementation linkages and partnership have been established with many stakeholders (they are already engaged) including Central and State Ministries of Agriculture, Institute of Desertification Studies of the University of Khartoum, Community Leaders, Civil Society Organizations (CSOs), Woman Development Association Network (Elfashir, Darfur), Relief NGOs, small-scale industries. The well-established active partnership and engagement of the national regulatory authorities such as the Central and State Ministries of Agriculture will facilitate the project implementation process, and build and strengthen national advocacy coalitions for supporting the and developing and promoting indigenous famine survival strategies to help people become resilient to famine-stricken in the future.

Challenges during Implementation. political unrest started in Sudan in December 2018 and continued to the (June, 2019). University of Khartoum was closed from December, 2018 to October, 2019, our University in particular was at the centre of the sit-in protest and access to the University was made impossible. Most of the registration of postgraduates students is carried out online and this was completed for the candidates chosen for the present projects. However, some steps required the personal present of the students and this caused some delay.

- Sudan in a vast country and travelling to different parts of the country, especially to Darfur, is quite a challenge.
- The safest means of transport to Darfur is air travel which is expensive (311 USD) and not so easy to get. Travel within Darfur is another big challenge the only means is road transport which is not quite safe yet, especially at autumn time.
- For most students, data and information would have to be collected from remote areas of the state. One of the most daunting challenges is to win the trust of the local people. Conflict has made them very wary and suspicious of strangers. The cooperation of local people is quite vital to the execution of the project.
- Lastly, transporting, experimental material, particularly large quantities of soil was another big challenge.

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