



Improvement of indigenous coping strategies of famine-stricken in Darfur States, Sudan

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Contacts:
Elhadi A. I. Elkhalil
Associate Professor of
Microbiology
University of Khartoum,
13314 Shambat, Sudan
Email: eaikhalil@yahoo.com
or eaelkhalil@uofk.edu

Project coordination
University of Khartoum

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Summary

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.

Overall objective:

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.

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.

Target Groups

The target groups in this action are; Farmers local authorities, local leaders, researchers in research centres and universities, leaders of the private sector in the state, small scale fermented food industries, NGOs in the area.

Result

1. Clear, easy and implementable indigenous famine-strikes survival strategies developed
2. The change happened in the level of awareness of the locale about the importance of the nutritive values of the local famine foods and their capability to adopt suitable strategies to cope with famines.
3. The economic impact of the project through the money saving attained by the beneficiaries due to the capacity building and adoption of the study recommendations.
4. The health impact through health measurement indicators like children malnutrition rate before and after the project.
5. A variety of abundant and nutritive famine foods identified, characterized, fermented and with long shelf-life preserved in the area.
6. The change happened in the level of awareness of the locale about the importance of the nutritive values of the local famine foods.
7. Attitudes of the actors and their keenness to continue effectively participating and their commitment to sustainability of the project after its completion.
8. The health situation of the vulnerable groups; children, pregnant and the elder people.
9. The degree of immense of the beneficiaries in practicing what had learned about preservation of famine food (the activities of the project)

General Activities:

1. Microbiological and biochemical studies at all the traditional fermented food samples collected
2. The development of cottage-level biotechnological methods for the production of better-quality fermented foods through use of pure cultures of microorganisms and small machinery.
3. The development, wherever needs of genetically improved starter culture through recombinant DNA technique, for use in fermented food.
4. Perform botanical studies of the potential famine food plants including indigenous wild edible plants (fruit-bearing trees, grass, vegetables, root and tuber-plants etc.) using morphological and molecular taxonomic methods, phylogenetic analysis of

plants etc. for identification and characterization.

5. Perform ecological studies of the potential famine food plants (e.g. wilds edible fruit-bearing trees and tuber-plants) including the major factors that affect the distribution and performance of the species (e.g degradation of habitat, Humans activities and its influence on habitat and species losses “extinction & extirpations”
6. Chemical analyses of all famine food samples collected including wild grass seeds, fruits, tubers and indigenous fermented foods.
7. Optimizing of storage conditions for long-term shelf-life of famine food (fermented or unfermented): studying the effect of drying and storage technologies along the famine-food value chain, vacuum-packaging system and storage temperature on shelf life of the fermented famine food.
8. Assessing and improving famine-food biosafety: microbiological and chemical evaluation of the effects of fermentation and preservation on the occurrence and accumulation of natural contaminants such as mycotoxins (pathogenic and beneficial microorganisms) and organic pollutants, as well as evaluating the health risks of their presence.

