



STATUS REPORT ON THE SMALL FISH FOOD PROJECT

SUBMITTED BY THE

CSIR-FOOD RESEARCH INSTITUTE TEAM

FEBRUARY 19, 2019

Small Fish and Food Security: Towards innovative integration of fish in African food systems to improve nutrition.

CSIR – Food Research Institute Team:

Amy Atter

Margaret Owusu

Jonathan Ampah

Anthonia Andoh-Odoom

Papa Toah Akonor

Overarching research question

How can socio-cultural, economic and institutional transformations of the fish chain, as well as technical and infrastructural innovations, contribute to improved, sustainable utilization of small fish resources for Africa's low-income population?

Introduction

The LEAP-agri “SmallFishFood” project offers innovative thinking, focusing on how utilization of small fish (often labelled as trash fish) can be transformed in a direction where fisheries governance, marketing mechanisms and health policies ensure that the value of these fish are recognized and utilized sustainably for human consumption and good health. The project seeks to achieve this in two (2) ways; through maximization and preservation of the nutritional value of small fish and through minimizing the environmental impacts and maintenance of the ecosystem structure and functioning. The project is in four main work packages however, the activities of the CSIR-Food Research Institute team are captured under work packages 2 and 3.

CSIR-FRI’s activities therefore are to identify and describe the harvesting, marketing and utilization patterns of small fish and how they contribute to food and nutritional security in Ghana, and improvement of the production processes to achieve better quality and longer shelf life. In Ghana, small fish have been categorized as having been overfished and there have been declining stocks over the past 28 years (Fisheries Commission, year?). However, the small fish industry in Ghana provides food security, nutrition, employment, income and maintenance of livelihoods for fishermen and fish processors. The traditional practice with sun-dried fish all over Africa involves drying the fish on the ground. This practice has led to concerns about the safety and quality of these small fish. In Ghana, small fish are usually fried and not sun-dried. This project therefore seeks to offer an alternative means of processing fish by sun-drying with improved, cost effective, user-friendly technologies, and the development of value-added products.

Brief Report from Kick-Off Meeting (8th – 10th November, 2018) University of Ghana, Legon.

On the 8th of November, 2018, a Pre-meeting of the SmallFishFood Team was held at the University of Ghana, Legon in Accra, Ghana. The meeting was hosted by University of Ghana and CSIR-Food Research Institute. As part of the meeting, all institutions that formed part of the team gave 20 minute PowerPoint presentations on their various institutions, the groups’ field of expertise and on work from the institution that was relevant to the deliverables in their work package.

Mr. Samuel Amponsah, staff of the CSIR-Food Research Institute team who was part of the initial project resigned. He was replaced by Mrs. Anthonia H. Andoh-Odoom and Mr. Papa Toah Akonor. Institutions represented at the meeting were CSIR-Food Research Institute, Kenya Marine and Research Institutes, National Agricultural Research Laboratory, Uganda, German Federal Institute for Risk Assessment (BfR), Germany, Institute of Marine Research, Norway, University of Bergen, Norway, University of Ghana. There was a visit to the CSIR-Food Research Institute followed by work package group discussions.

The Kick-off Meetings were held on the 9th and 10th of November, where the work packages drew conclusions on various aspects of their activities. There were other presentations from Prof. Francis Nunoo of the Fisheries Commission of Ghana and Mr. Kofi Agbogah of Hyen Mpoano, an NGO.



Work package 2 & 3 group discussions

The initial concept note indicated that the study will focus on two fishing towns in four coastal areas in Ghana namely, Western Region, Volta Region, Central Region and Greater Accra Region. The selection of these fish landing sampling stations was based on geographical location and the presence of fish-drying activities by fish processors. The fish species that had been selected for the study are anchovies, burrito and round mackerel. However, at the kick-off meeting of the LEAP-Agri team held at the University of Ghana, Legon from the 8th – 10th November, 2018; it was decided that the number of fishing towns for the study be reduced to four in three coastal regions. Additionally, the variety of fish to be used in the study was reduced based on a report from Hen Mpowano, a non-governmental organization working on fish, that the availability of small fish was a problem due to dwindling numbers and types of small fish. With respect to the design of the drying racks, it was also decided based on proposed designs for durable drying racks that could withstand the harsh coastal weather conditions and would not require major maintenance. It came to light that it was better to erect raised concrete platforms instead of solar tunnel dryers. In light of this, considering the high cost implications of concrete platforms, the number of sampling sites was reduced from eight to five to cater for the cost of the raised concrete platforms and five robust sealing machines for the packaging.

Study areas

It was agreed at the meeting that CSIR-FRI's activities would focus on four fishing towns in three coastal regions in Ghana, namely Volta Region: Adina; Central Region: Moree; Greater Accra Region: Tema-Newtown and Jamestown.

Selected Fish Species:

Anchovies and Sardinella

Main Activities of CSIR-Food Research Institute Small Fish Team

1. Construction of an improved fish drying platforms/fish rack and provision of sealing machines for the fishing communities.
2. Microbiological and chemical analysis/trace metals on fish before and after drying. This will be carried out before and after training the processors in GMP/GHP.
3. Value addition – salting, milling and packaging, inclusion in existing foods and development of new food products to enhance products' shelf life and utilization.
4. Sensory and consumer acceptability test.
5. Shelf life studies (Microbiological and chemical analysis).
6. Technology transfer.

REVISED FLOW CHART OF ACTIVITIES



Meeting with Stakeholders

Meetings were held with stakeholders in the Selected Fishing Sites, between the CSIR-FRI team and Fish processors and their leaders in these areas. The aim of these meetings was to engage fish processors and find out about their drying practices and challenges associated with fish drying in these areas. A structured questionnaire was used to obtain information for this purpose. Evidence of these meetings are shown in the Figures 1-3.



Figure 1: Stakeholder engagement at Moree, Central Region



Figure 2: Stakeholder engagement at Adina, Volta Region





Figure 3: Stakeholder engagement at Tema New Town, Greater Accra Region



Figure 4. Dried Bumper fish for sale at Tema New Town

Small fish types and current drying practices

Small fish found in the four fishing communities included anchovies, burrito, round sardines, friget mackerel and bumper. However, bumper and anchovies were the species often dried and not Sardinella as the team earlier selected. In view of this, the team has decided to work on anchovies and bumper instead of anchovies and Sardinella. In the communities visited, small fish, especially anchovies, is mainly dried on the ground as shown in Figure 5a. The team unfortunately did not observe the drying of bumper fish at any of the four sites. Other species of small and big fish such as round sardine, hoarse mackerel are dried on drying racks as captured in Figure 5b before smoking. The treatment of the fish before drying was similar among the communities. For anchovies, some wash with the sea water, pipe borne water or water from a lake and sprinkle them

on the ground to dry for 2-4 days depending on the intensity of the sun. A few sprinkle the fish directly right from purchasing from the boats. The common challenge expressed by the processors was the washing away of the fishes during the raining seasons. A number of the women processors also indicated lack of capital for their fish business. When well-dried and packaged, the fish can be stored for up to a year.



Figure 5a: Drying small fish on the bare ground



Figure 5b: Drying of sardinella and bumper fish on racks

Visit by LEAP-Agri team

SmallFishFood according to the LEAP-Agri team is a very interesting project for both its objectives and its elaborated partnership and so was selected for a field visit, presentations and discussion. The entourage from the LEAP-agri team comprised of **Bernard Mallet (Deputy Coordinator, LEAP-Agri Project)**, **Cristina Soriani (EC REA officer)** and **Henning Knipschild (BLE funding Agency representative from Germany)**. The objective was to give the EC representatives better understanding about food security questions and fish contribution in the Ghanaian (*and African*) context. Also for the SmallFishFood team to explain the research activities to be conducted during the project and its expected impact.

The entourage together with the CSIR-FRI team members visited the Tema New Town landing beach on Saturday 2nd February, 2019. They observed the various types of fishes, interacted with fisher folks and the women selling at the fish market. Major players in the fish supply chain including but not limited to canoe operators, providers of ice blocks for preservation, transporters, pre-mix fuel suppliers for outboard motors, cold store owners among others were also identified and spoken to (Figure 6). The team also visited some processing sites which provided them a practical feel of the local means by which fish is processed and preserved in general for consumption by the public. The team made a stopover at CSIR- Food Research Institute's

microbiology laboratory to see the facilities available. The day ended with a short meeting at the Department of Population Studies, University of Ghana with our University counterparts on the project. The discussion amongst other things focused on the initial misunderstanding between the local LEAP-Agri team here in Ghana and SmallFishFood project team in Ghana on the direct funding from the German funder, BLE without the direct involvement of the local LEAP-Agri team. Also, the funding for the Ugandan team was tabled which according to the LEAP-Agri team was still under discussion.



Figure 6: Visit by the LEAP-Agri team

Stakeholder Engagement at James Town Beach Landing Site

From discussions with the women fish processors (Figure 7), it came to light that they would prefer concrete floors located elsewhere to dry their small fish because of Government plans to convert that location into a harbour. Inadequate land size had also forced some of them to dry their fish along the sidewalks/pavements of the high street.



Figure 7: Stake holder engagement at James Town Beach

Conclusion

Current drying practices in the communities are unsatisfactory and need improvement. The Project would provide new technology for drying to reduce postharvest losses through value addition to fish. It is also envisaged that livelihoods would be improved through creation of jobs, and increased income generation in the fishing communities. Additionally, the project deliverables will create new markets, provide safer fish and enhance nutrition among the people of Ghana.