

REPORT OF FINAL SYMPOSIUM OF THE SMALLFISHFOOD PROJECT



HELD AT

CSIR-FOOD RESEARCH INSTITUTE, ACCRA

7TH- 10TH JUNE 2022

REPORT BY: ERIC OFORI, ANITA ADUSAH AND AMY ATTER

INTRODUCTION

The final symposium for the dissemination of SmallFishFood project activities and findings was held at the CSIR-Food Research Institute from 7th to 10th June 2022. Partners from Norway (University of Bergen, Institute of Marine Research); Netherlands (Wageningen University, University of Amsterdam); Germany (German Federal Institute of Risk Assessment); and Ghana (University of Ghana, CSIR-Food Research Institute). The theme for the workshop was, “*Small Fish and Food Security: Towards innovative integration of fish in African food systems to improve nutrition*”.

DAY 1

Work Package (WP) Meetings

On the first day, partners were welcomed into the CSIR-Food Research Institute by the Deputy Director, Dr. Charlotte Oduro-Yeboah in the company of other Heads of Division. The overall PI, Prof Jeppe Kolding outlined the purpose of the meeting on behalf of the SmallFishFood Project team. Dr. Charlotte Oduro-Yeboah wished the team well and pledged the institute’s support that may be needed by the partners and excused themselves for the meeting to continue. Partners then worked on their presentations for DAY 2 in their respective Work Package (WP) groups. It was agreed that the WP presentations should be based on work done and key findings on the project and should be presented by the Ghanaian partners while Prof Jeppe Kolding gives the symposium presentation of an overview of the entire project.



Work Package Discussions

DAY 2

A hundred and five (105) participants drawn from research institutions, academia, regulatory bodies, governance agencies, fish processors, policymakers, related projects, media, and other key stakeholders in the small fish value chain in Ghana as well as the SmallFishFood partners participated in the workshop.

OPENING REMARKS

Delivering his opening remarks, the Acting Director of the CSIR-Food Research Institute, Prof. Charles Tortoe indicated that the goal of the Institute is to assist in poverty alleviation through the creation of opportunities for generating & increasing incomes with the micro, medium, and large-scale food industry, and application of cost-effective food processing technologies that are environmentally friendly. He said, in line with its vision, the CSIR-Food Research Institute collaborated with the SmallFishFood project, and worked towards the innovative integration of fish in African food systems to improve nutrition. According to the Ag. Director, traditional practices of sun-dried fish all over Africa and in Ghana involve drying the fish on the ground and current drying practices in the communities were unsatisfactory and needed improvement. One of the project's objectives therefore at CSIR-FRI was to improve the production processes to achieve better quality and longer shelf life. For this reason, the project was to provide new technology for small fish drying to reduce post-harvest losses through value addition. He said the successful implementation of the activities is evidenced by successful stakeholder engagements, technical reports, training manual, flyers, journal publications, media publications, and engagements and in the form of developed products namely the hygienic and improved packaged sun-dried small fish, sun-dried fish fortified pepper sauce (*shitor*), waffles, biscuits, doughnuts and cereal mix which have been exhibited for all to see. He was optimistic that the successes chalked in the project will promote further collaboration between project partners in future funding opportunities. He wished participants and the project team a successful closing symposium.



Prof. C. Tortoe delivering his opening remarks

OPENING OF SYMPOSIUM

Opening the symposium, Professor Jeppe Kolding, the overall Principal Investigator/Coordinator of the project, thanked participants, especially the Ghanaians, Norwegians, and Dutch partners for attending the workshop. He explained that the other partners from Kenya and Uganda were unable to attend the workshop due to financial constraints. He disclosed that the SmallFishFood project was a 3-year project which commenced in 2018 but was extended for a year because of the COVID-19 pandemic. It was part of the EU Horizons 2020 Leap-Agri Project, with a total budget of €1 million. He expressed concerns about the fact that many food intervention programs focused on grains and cereals with little being said about fish. He said the fish debate was ignited after research by experts on Food Security and Nutrition in 2014 revealed that the ocean contributed 50% of the global biological production of fish but humans collect only 2% of their food from the ocean.

He gave analyses of the biggest source of fish harvestable which included catching wild small fish species from both marine and freshwater fisheries which he said was the most energy and cost-efficient human food production system. He also indicated that they had the least environmental impacts in terms of greenhouse gases, water use, fertilizers, insecticides, or herbicides compared to any other human food production systems. According to him, fish are not mammals, young fish are likely to die, and only a fraction (<1 %) will ever mature but large fish have more eggs.

On why the need for small fish, he mentioned the essential micronutrients such as zinc, iron, vitamin A, and calcium which are obtained from small fish. He added that many of these micronutrients are not in filleted muscle but in bone, head, and viscera. He elaborated on the micronutrient along the value chain from hook to fork and added that catching small fish improved the ecosystem while eating small fish improved human health.

In conclusion, he mentioned that the SmallFishFood project has produced results in spite of the Covid pandemic, which prevented some fieldwork, travels, meetings, and workshops, which have been disseminated through eight (8) published papers, seventeen (17) draft papers under preparation for publication, and four (4) video presentations being prepared for public dissemination. The project also sponsored four (4) Ph.D. students and twenty (20) MSc. students.



Prof. Jeppe delivering his presentation with participants listening at the symposium

PRESENTATIONS BY WORK PACKAGES

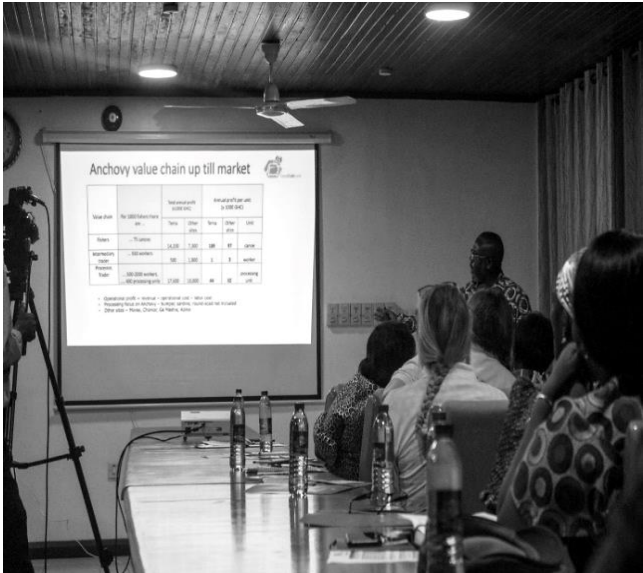
Work Package 1:

This presentation was made by Prof. Francis Nunoo of the University of Ghana. In his presentation, he acknowledged both Prof. Charles Tortoe and Prof. Jeppe Kolding on how their speeches were relevant to the gathering. He indicated that the fish supply in Ghana is from multiple sources. Large importer of fish, mostly small pelagics, small and growing aquaculture sector, mostly tilapia. Also, a significant inland fisheries sector has much uncertainty in terms of the actual volume of landings. And finally, the marine capture fishery altogether supplies the average Ghanaian with 25-35 kg of fish per year, one of the highest in the world. He mentioned that small fish are gotten from industrial trawlers, of which about 76 trawlers have been licensed, semi-industrial (Ghana boat) has about 350 boats, and artisanal has over 14,000 canoes which were the focus of their work.

He added that semi-industrial and artisanal produce small fish which is approximately 200 000 tons and industrial produce small fish of approximately 75 000 tons. He mentioned that their research study focused on the marine pelagic species which comprise the bulk of the catch such as sardinellas, anchovies, chub mackerel, Atlantic bumper, moon fish and round scad, and other small fish from other species. From their study, they were able to develop a value chain for canoe fishery in Ghana. It moves from fisher, intermediary trader (comprising consumers and fish meal), processor, trader (wholesaler, retailer, consumer, and others). According to him, the value chain begins from the fisherman/woman to the intermediary trader to the processor to the trader, wholesale, retailer to consumers. He explained that according to the research there is a value added to the fish as it moves along the value chain. He stated that using anchovy for instance at the Tema landing area, the value of fresh fish is very low with the fisher, but increases slightly at the intermediary fresh fish trader who also earns very little per kilogram and further increases with the processor and trader who earn more by trading.

In conclusion, he indicated that there has been a shift from the consumption of sardinella to anchovy in recent times. There is high labour intensity for each canoe, ranging from 27 - 47 workers up the value chain from

fishers to processors/traders. Processors/traders and boat owners obtain the highest profit in the chain and not the workers, especially during the high season.



Prof. Francis Nunoo presenting to participants

Work Package 2&3

The key finding from the survey was presented by Mrs. Amy Atter of the CSIR-Food Research Institute. She indicated their study focused on improving the processing of small fish as food. According to her, it was realized from the study that Ghana has a strong distribution and marketing system of fish, and fish caught in Accra is easily transported to every part of the country. She indicated that small fish is readily available, affordable even for the rural and urban low-income groups, very nutritious, can be used in most foods, and contributes to food and nutritional security in general. However, quality loss emanating from improper handling of fish, poor storage conditions, and many other bad practices reduce its nutritional quality as well as the cost and value of fish. The study also identified the quality and safety issues in the value chain (harvest, processing, storage/transportation/trading), and the possible cause of contaminations. She mentioned the value chain from harvesting where there is possible contamination from different chemicals including heavy metals, microorganisms, and parasites; processing where there is the reduction of nutrients, microorganisms, and contamination by processing byproducts; storage/transportation/trading where there may be a reduction of nutrients, contamination and growth of microorganisms of which certain moulds may even produce aflatoxins; and food preparation where there may be insufficient heating, destruction of vitamins, and contaminants.

She indicated that their study revealed that the quality of processed small fish is rich in proteins and micro-nutrients and significantly contributes to a balanced diet directly or as a fortifier. However, the nutrient composition depended on fish species so advised participants to consume different varieties of small fish. She added that market samples of smoked small fish showed high levels of PAH above the recommended limit in most samples. There were also high microbial counts of processed samples of small fish obtained from some markets in Ghana. There is a need to improve hygienic practices and conditions, smoking methods, and ovens. She indicated that another area of their study was improvements in the sun-drying of small fish through the introduction of wooden platforms and netted racks. She added that the team trained women fish processors and sellers on best hygienic practices, processing practices, packaging, and product development (value addition) in four selected fishing communities in Ghana.

She concluded and gave some recommendations recognising the importance of small fish in the food system for food and nutrition security. She added that the nutrient content of small fish was shown to be higher than in some big fish species like tilapia. For that reason, people should not look down on them but value them and increase their consumption as they significantly contribute to a balanced diet, eaten directly or as a fortifier in other foods, especially carbohydrate-dense foods. She also recommended inclusive and collaborative technology improvements needed such as smoking ovens, hygienic practices, and support for the value chain actors especially women with suitable training and infrastructure.



Mrs. Amy Atter making her presentation

Work Package 4

Prof. Joseph Yaro bemoaned the risk of policy bias against small fish in Ghana. He stated that emphasis on small fish is absent in the following national policies: Fisheries and aquaculture sector development plan 2011-2016; Ghana Fisheries Act 2002 (Act 625); Ghana Fisheries Amendment Act 2014; Ghana Fisheries Amendment Regulations 2015 (LI 2217); Ghana Fisheries Regulations 2010 (LI 1968); National Fisheries Management Plan 2015-2019; Ministry of Fisheries and Aquaculture Development. Medium Term Expenditure Framework: 2019-2022; Food and Agriculture Sector Development Policy (FASDEP II) 2007; and National Nutrition Policy 2016.

He indicated that there is a policy silence on small fish benefits because of the risk of artisanal fishers targeting small fish getting delegitimized; policy bias against small fish harvesting because of the risk of women fish processors' infrastructure & viability being neglected; and policy push for aquaculture growth because of risk of small fish diverted to fishmeal. He indicated that by so doing, there will be fewer fish for lower-income groups and more fish for the rich since small fish are more affordable, more nutritious, easier and cheaper to process, transport & storage and have strong consumer preference.

He concluded by recommending that there is a need to recognize the benefits of small fish in fisheries, aquaculture, health, and social and economic policies. Explicit food security and nutrition policies that promote the consumption and utilization of small fish, especially among low-income groups. Facilitate infrastructure and technology required for sustainable harvesting, processing, and marketing of safe and nutritious small fish. Avoid an implicit institutional focus on aquaculture at the cost of small fish. Preemptively prevent small fish to be used in fishmeal for animal feed. Effective collaboration and communication among stakeholders in the small fish value chain.

should train fish traders on how to handle fish in the markets but does not involve the MMDAs workers such as city guards whose work is in the markets to ensure that the traders are practicing what has been taught, the impacts of the training program will not be felt. He called on institutions to do more collaboration and work together to achieve their objectives. On the issue of technologies developed, he indicated that there should be timelines in upscaling technologies and there is a need to find synergies between the innovations developed and how effective they can be employed to solve problems. In doing so, he said local craftsmen in the districts and municipalities should be involved in the development and production of the technologies. He concluded that no institution can execute its mandate if it does not have a broad-based human resource who will support them.



Prof. Joseph Yaro presenting to participants

There were further discussions and contributions on the key findings of the project as presented and participants asked questions and made contributions to the presentations.

- The statement “which of the small fish should be caught and which of them should not be caught” was food for thought for the gathering.
- On food safety issues, a participant who had observed that some fish traders sprinkled or waxed oil on smoked fish displayed for sale to make it look fresh whilst others lighted mosquito repellants to ward off flies; and enquired if those practices were acceptable. A representative of the National Fish Processors and Traders Association (NAPFTA) told participants that such practices were not acceptable, and NAPFTA has been educating its members to desist from such practices. The sprinkling of oil (waxing) was explained that after fish had been exposed to the sun and dust, the traders sprinkle the oil just to make it look fresh. Even though she admitted that there are health issues, she called on stakeholders to help educate the traders on food safety practices. She added that educating and helping to certify fish processors were part of the mandate of the association and was certain fish processors and traders involved in unacceptable practices may not be members of the association or a few bad nuts among NAPFTA members. Another processor indicated that the sprinkling of oil on the fish is an indigenous technology for preserving the fish. She indicated that the practice should not be condemned totally but it is done in the interest of the consumer. The buying of fish that is subjected to these practices remains the choice of the consumer. A representative from Food and Drugs Authority (FDA) informed the participants that the Authority has been educating traders on food safety practices and assured participants of continued education to the traders. She disclosed the FDA is propagating safer food for safe health.
- A member of the Tema Fish Processors Association told participants that the association does not receive any support from fish projects in Ghana even though many of them visit them and assure them of some support that never materialise. She called for platforms for learning and other intervention programs for fish processors.

- A participant bemoaned that there is no representative of Fish Processors at the National level where policies and strategies are formulated. This she said is a worry to the associations since their sentiments and problems do not get to the National level even though they have national executives and therefore called on stakeholders to ensure there is a representative of the National Association. A participant indicated that the associations have promoted dialog between members and have improved on their activities.
- A processor from Ningyo-Ahwiam compared the technology learned from the implementation of the SmallFishFood project which has helped them a lot; drying of fish is now done on a rack which prevents it from dust and other forms of contamination. He said new products such as fish powder and doughnuts have been developed. But her concern was the absence of a market for their newly developed products. A participant from FDA indicated that they have registered a lot of new products developed from fish. She informed her about the procedures to go through to get the product to the formal markets.
- On technology dissemination, a participant informed the gathering that technologies have been developed without the involvement of local artisans and end users. She cited the Ahotor smoking oven which the majority of the beneficiaries have abandoned because of challenges they encountered in their usage. She appealed to researchers to work closely with the beneficiaries for maximum impact and use of technologies. She appealed to the researchers and NGOs again to reconsider the improvement of the Ahotor oven and address its challenges for the processors.

Messages from Partners

Messages were received from other partners including MOFAD, FDA, GSA, Fisheries Commission, FAO, NAFPTA, TMA, GIZ, Safe fish Project, GFRA, DAA, Healthy Food Africa, TMA, UG, etc. They informed participants about their activities and how they are contributing towards promoting small fish.



HealthyFoodAfrica Project



Ghana Standards Authority



Food and Drugs Authority



Univ of Ghana, Dept of Marine and Fisheries Sc



Fisheries Commission



USAID-Ghana Fisheries Recovery Activity (GFRA)



GIZ Ghana



Ministry of Fisheries and Aquaculture Development



Food and Agriculture Organization



National Fish Processors and Traders Association



Development Action Association



Tema Fish Processors Association



Safe Fish Project

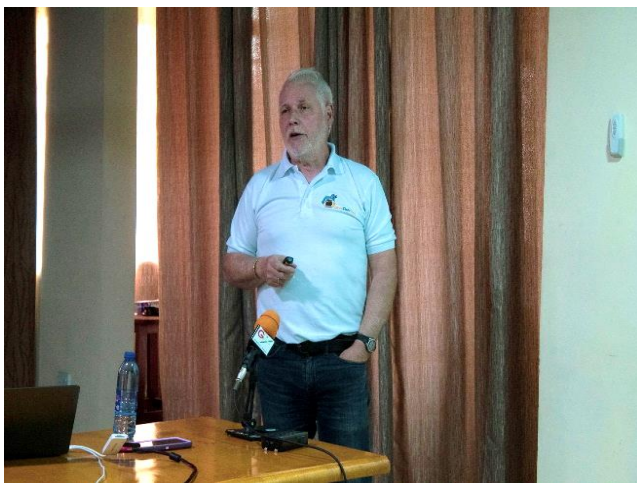


Tema Metropolitan Assembly

Stakeholders making their submissions

Closing Remarks

In his closing remarks, Prof. Jeppe Kolding informed participants that the project will be officially over in August but the issue of small fish will not be over. He informed participants to expect more publications from the team even after the official closing. He thanked CSIR-Food Research Institute and the Director, Prof. Charles Tortoe for hosting them, Mrs. Amy Atter, the PI at CSIR for organising a very successful workshop, Prof Joseph Yaro, Prof Nunoo, Dr. Austin Ablo, all the partners from Norway, Netherlands, Germany for their participation and all other partners who couldn't make it to the workshop.



Prof. Jeppe Kolding giving the closing remarks

The symposium was moderated by Dr. Austin Ablo and a vote of thanks was given by Ms. Priscilla Atta-Peters.



Dr. Austin Ablo moderating



Ms. Priscilla Atta-Peters giving the vote of thanks

EXHIBITION OF PRODUCTS DEVELOPED UNDER THE SMALLFISHFOOD PROJECT

As part of the program, products developed by the SmallFishFood project were exhibited and tasted by partners and participants. These were hygienically processed and packaged fish, fish powder, fish sauce (*shito*), and fish-fortified foods including porridge, *apapransa*, biscuit, doughnuts, *mpotompoto*, *yakeyake*.



Products developed from small fish (shito, fish powder from anchovies)





DAY 3

Partners worked on the editing of the short four video scripts and voice-overs highlighting the issues around small fish as were discussed and researched during the SmallFishFood project span. The four videos highlight different aspects of the biology, fishery, processing, value chain, and policies of small fish. They will focus on:

- Biology fisheries and productive capacity of small fish
- Processing, trading, and the role of women
- Nutrition and the importance for food security
- Fish for food or feed, and lack of policy attention

The session was moderated by Paul van Zwieten. Amy Atter and Jane Fonda Awuor were to work closely with the video teams in Ghana and Kenya respectively.

Meetings within the different work packages continued and discussions centered on all outstanding publications from the different WP and how to work on them quickly to get them finalized and published. Jeppe thanked all partners once again for their commitment throughout the period to this fantastic project. He asked all PIs to provide the necessary information to him when the time comes for the final report submission to LEAP-Agri later in the year. He opined that this consortium is a formidable one that should be maintained for other interesting calls in the future. According to him, he will be on retirement but he is ready to play other roles aside from the project coordinator role. He wished all safe journey back home,







Discussions ongoing among partners



Photograph of some partners and staff of CSIR-FRI who gave assisted

LUNCH

Lunch was provided by the GS Plaza hotel.



Conclusion

The final symposium of the SmallFishFood project was a very successful one which brought together key stakeholders in the fish value chain. Through the dissemination of results using various platforms including this and other workshops, conference presentations, publications, media channels (national television, newspaper reportage, radio, and online), and others, the project was able to project small fish to the world. Even though it is officially over, it is the hope of the consortium that the promotion of small fish consumption will never be over.