

TERMS OF REFERENCE

To promote the production of fish silage and its derived products in the Caribbean

Title: Develop a Business Case for the Production of Fish Silage and its Derived Products in Barbados.

Location: Barbados

Duration: 100 days over a period of 6 months

1. Introduction

Fish by-products constitute between 30–70 percent of fish after being processed into fillets and other edible products, and were previously considered to be waste. In Barbados, the 2019 data¹ approximately 5 tons of these fish parts generated daily has reached 8.2 tons in 2023²; the largest share of which is redirected to the landfill. The direct impacts include the environmental burden of the waste, since the decomposing offal produces abundant quantities of methane, a gas with an estimated 20 times more global warming potential than carbon dioxide, thus contributing to climate change. Another major consideration is the continued demand for landfill space in circumstances of land scarcity within the context of Small Island Developing States (SIDS). This waste is a missed opportunity for transforming the previously untapped raw materials into valuable food and silage-derived products (feed and fertilizer). These lost opportunities are increasingly important in a world with rising food, feed and fertilizer costs impacting farmers and consumers alike.

The Food and Agriculture Organization of the United Nations (FAO) and partners from national and regional institutions have been working to optimize the recovery process of the fish waste while establishing the safety, comparative growth performance and cost efficiency of fish silage-derived feed relative to imported feed, and their cost efficiency. Awareness of this prompted the establishment of a national fish silage platform, leading to the integration of the fish waste utilization concept in the 2023-2033 Fisheries Policy of Barbados, capacity building of women fish processors, inclusion of small-scale farmers and investment for scaling up.

In 2023, FAO in collaboration with the Central Fish Processors Association (CFPA), Barbados Ruminant Farms Services Inc. (BRFS), and other stakeholders in Barbados, conducted an analysis to explore the feasibility of fish silage and livestock feed production. The analysis involved a cost of production assessment and several simulations, considering in-kind farmer labour, contributed best raw materials from fish processing, partnership with various government ministries and departments to provide a facility and utilities, and compared that production cost to the price of its imported equivalent.

Given the results thus far, an appropriate business model should therefore be framed as a reflection of the current eco-system of support with institutional commitments and resource strengthening. It should be structured upon finalization of the processing and storage capacity of the production facility as well as market price determination, marketing costs and the development of a wider range of fish silage-derived livestock feeds and fertilizer, including relevant nodes in the value chain that can realistically be controlled by women and youth fishers' suppliers of rest raw materials.

In summary, the bioeconomy opportunities involved in transforming the discarded raw material from fish processing into a valuable resource include supplementary agribusiness and income generation, contributions towards realizing CARICOM's goal of reducing the extra-regional food import bill by 25% by 2025 while simultaneously easing the local and regional feed import dependence and foreign exchange demand pressure, as well as other social inclusion, environmental, economic and land use impacts. The

¹ Drakes, C., Mackey, T. & Wood, J. 2020

² King, Diei-Ouadi and Cox, 2024

Barbados case also supports the government's zero-waste goals while incorporating two key stakeholder groups: Central Fish Processors Association (CFPA) and the Barbados Ruminant Farms Services (BRFS) which comprise of women fish workers and youth farmers. This intervention is well aligned with the 2030 Agenda for Sustainable Development. It holds promise for other countries in the Caribbean region and internationally, given that livestock feed and fertilizer importation and fish processing are common to all CARICOM countries and many developing countries globally.

The objective of this Consultancy is to prepare a comprehensive business investment case that will map the Value Chain of fish silage as livestock feed and fertilizer in Barbados, with a focus on production cost. It must consider all institutional commitments to the business model in order to realistically reflect the operational dynamics of the proposed production facility, management, and marketing arrangements. Additionally, the service provider is expected to explore the marketability of fish silage and livestock feed and fertilizer products in Barbados, including selected viable nodes in the value chain in the first instance, such as the provision of safe and quality fish waste. Consideration should also be given to potential markets in neighbouring Caribbean countries mindful of the logistics and market entry requirements.

2. Purpose

To develop a Business Case for the Production of Fish Silage and its Derived Products in Barbados through a Value Chain Assessment.

3. Scope of Work

Under the general direction of the CRFM Executive Director, the Consultant will be contracted to undertake the assignment. The Consultant will work in close collaboration with the Deputy Executive Director, the Programme Manager, Fisheries Management and Development, the Advisor, Fisheries Management and Development, and the Statistics and Information Analyst in the delivery of the assignment.

Although, the Consultant will work in close collaboration with the above-mentioned personnel, it is understood that the Consultant is responsible for producing the deliverable of this assignment and contribute to its outputs.

The Consultant, working with the CRFM Deputy Executive Director, CRFM Programme Manager, Fisheries Management and Development, Advisor, Fisheries Management and Development, the Statistics and Information Analyst, and the selected CRFM Member State will:

1. Participate in a briefing session with the CRFM Secretariat, FAO, and the Barbados Fisheries Department to review the Terms of Reference and obtain clarifications and additional directions, if required.
2. Conduct desktop review of the relevant literature/documents, conduct field visits (as required), and organize/facilitate consultations with the CRFM Secretariat, Fisheries Department, fisherfolks, the Central Fish Processors Association (CFPA), the Barbados Ruminant Farms Services (BRFS), and key stakeholder groups (academia, NGOs, etc.,) on the objective of the consultancy and the scope of work to be done.
3. Prepare and submit Inception Report to the CRFM Secretariat outlining the detailed workplan and description of the methodology to be used to develop the business case for the production of fish silage, including timeframe and log frame. The Report should also identify strategy to collect the necessary data and engage with stakeholders.
4. Review the findings of the previous feasibility analysis conducted by the FAO and conduct a cost of production analysis, including:

- i. Detailed cost analysis of fish silage and derived products (feed, fertilizer) production processes, including but not limited to:
 - a) Cost of raw materials (fish and rest raw material)
 - b) Cost of labour (vis in-kind farmer labour)
 - c) Cost of facility and utilities (considering partnership with government partners)
 - d) Allocation of cost of production equipment, machinery and other fixed assets
 - e) Other operational expenses
 - ii. A comparison of the cost of local production to the price of imported equivalent feed and fertilizer products outlining the approach to sales and distribution, promotional activities, women and youth fishers and farmer engagement.
5. Assess the market demand and potential for fish silage and livestock feed and fertilizer products in Barbados and neighbouring Caribbean countries to identify any export potential. The market assessment should include
 - a) A competitor analysis to understand the competitive landscape.
 - b) A price analysis model outlining the cost-to-trade, demand assessment, market segments, and distribution channels.
 - c) A comprehensive market entry strategy outlining the approach to sales and distribution, promotional activities, women and youth fishers and farmer engagement mindful of imported equivalent product.
6. Assess the elements, the national actors involved, and the social and environmental sustainability in the fish silage Value Chain.
5. Develop a business investment case outlining the financial feasibility and potential returns on investment for fish silage and livestock feed and fertilizer production. The business investment case should include a conceptual framework and price analysis for stakeholders to consider, when determining a market price for fish silage and livestock feeds and fertilizer, if these are to be sold on a retail and wholesale basis. It should also identify potential market segments and distribution channels for the agricultural products derived from fish silage.
6. Compile all the previous analysis and information gathered in a final report, on the basis of a standardized model provided.
7. Present the final technical report, findings and recommendations to national and international stakeholders in a final workshop organized with the support of FAO Bioeconomy team and FAO Barbados Country Office. The stakeholders involved should include representative from:
 - the fish processing industry in Barbados (ex. SHORELINEZ),
 - the poultry and swine industries in Barbados,
 - the upcoming FAO and China South-South Cooperation initiative on fish silage.
 During the workshop, the participants will be invited to discuss possible applications and synergies for the business plan developed in the final report.
7. Prepare and submit Final Consultancy Report to the CRFM Secretariat A suggested format include – objective, methodology, achievements, problems encountered, conclusion, recommendations, Annexes (all technical reports, consultations/workshop reports, all technical report(s), and photographs).

4. Target

The target audience for the assignment will include national fisheries administration, fisherfolks, key stakeholders in the selected fisheries and other related sectors, national and regional policy markers at the highest level, and regional fisheries bodies.

5. Expected Outputs/Deliverables:

In collaboration with the CRFM Secretariat, the Consultant will achieve or deliver the following outputs:

- i. Inception Report
- ii. A detailed report outlining the cost of production processes for fish silage and selected derived products.
 - a. Market assessment report including: A price analysis model outlining the cost-to-trade, demand assessment, market segments, and distribution channels.
 - b. A comprehensive market entry strategy outlining the approach to sales and distribution, promotional activities, women and youth fishers and farmer engagement mindful of imported equivalent products.
 - c. A report defining the elements, the national actors involved, the social and environmental sustainability of the fish silage Value Chain.
 - d. Summary business investment case highlighting financial feasibility and potential returns on investment.
 - e. Final report on the assessed Value Chains collating the previous reports.
 - f. Presentation of findings and recommendations to stakeholders.
- iii. Final Consultancy Report

6. Reporting

The consulting firm or consortium will produce the reports/deliverables as indicated above. Upon submission of each draft report the CRFM Secretariat will provide comments and inputs within 10 working days. The consulting firm or consortium is required to make the changes and revert the report in 5 working days.

All reports must be written in English and submitted as electronic Microsoft Word document for review and final presentation. Final reports should be presented to the CRFM Secretariat, Princess Margaret Drive, Belize City, secretariat@crfm.int for distribution to the key stakeholders and other parties of interest. The approved final reports will be presented to the national government and the CRFM governing bodies.

7. Key Experts

The consulting firm or consortium identify the team of consultants, including a designated team leader. The profiles of the key experts for this contract are as follows:

Key Expert 2: Agriculture value chain and Marketing Specialist and Team Leader

Qualifications and skills

- A Master's degree in Agricultural Economics, Agricultural Development or Development Economics with a specialization in Agriculture.

General professional experience

- Minimum 3 years' experience relevant to assignment i.e. Minimum three years of work experience in the field of agri-enterprise development/ agriculture marketing/ agri value chain studies/ agriculture or fisheries based.
- Experience with value chain analysis, having conducted at least two value chain assessments as the lead consultant.
- Strong knowledge of private sector operations in agribusiness.

Specific professional experience

- Experience in working independently and leading project support for agribusinesses.

- Ability to manage project deliverables and meet deadlines.
- Excellent communication skills via written, spoken, and graphical means, including the ability to communicate scientific results and practices to technical and non-technical audiences.
- Experience working with Small Island Developing States (SIDS), particularly one or more CRFM Member States, and specific local expertise working in Belize will be considered an advantage.
- Experience in carrying out consultancy assignments for international development partners will be considered an advantage.

Key Expert 2: Agri-business Specialist

Qualifications and skills

- A Master’s degree in Agri-Business Management or MBA in the field of Marketing/Finance/Economics, or Business Administration with a specialization in agribusiness, or a related field.

General professional experience

- Knowledge of agribusiness financing and investment
- Demonstrable relevant technical expertise, understanding of the fish silage, feed, fertilizer, and/or small livestock sectors and significant experience of working in the abovementioned sectors through business development or hands on work.

Specific professional experience

- Experience in carrying out consultancy assignments in the Caribbean will be considered an advantage.
- Experience working with local communities and traditional leadership.
- Excellent organization and coordination skills and attention to detail.
- Possess strong skills in coordination, intercultural communication and networking; and excellent skills in spoken and written English.

Other Experts

CVs for experts other than key experts will not be evaluated during the evaluation of this proposal but should be included in the tender.

8. Duration of Assignment

The assignment shall be conducted during the period October 2024 to February 2025.

9. Time Allotment and Deadlines

The tasks shall be conducted and completed as follows:

Task	Reports	Deadline for completion
1. Briefing session with the CRFM Secretariat and FAO	No later than two weeks after the start of the assignment	8 November 2024
2. Inception Report	1 report of at least 10 pages in English on workplan, timelines and fitness of the TOR.	

<p>3. Report on cost of production (COP)</p>	<p>1 report of at least 10 pages in English on cost of production delivered.</p> <p>The report should include a detailed analysis of the cost of production of fish silage derived products production processing.</p>	<p>14 November 2024</p>
<p>4. Report on market assessment</p>	<p>1 report of at least 10 pages in English on the market assessment for fish silage in Barbados delivered.</p> <p>The report will assess the market demand and potential for fish silage and livestock feed and fertilizer products in Barbados and neighbouring Caribbean countries to identify any export potential.</p>	<p>25 November 2024</p>
<p>5. Report on elements, actors, social and environmental assessment</p>	<p>1 report of at least 20 pages in English on the elements, national actors involved, and social and environmental sustainability of the fish silage Value Chain in Barbados delivered.</p> <p>The assessment will map the VC, analyzing the main step of production, the species biology and ecology, the actors involved, the social (gender equality and youth involvement, decent employment and impact on food Security) and environmental (sustainability, impact on ecosystems, carbon footprint, and contribution to climate mitigation) aspects of the fish silage and livestock feed and fertilizer production in Barbados.</p>	<p>1 December 2024</p>
<p>6. Business Investment Case</p>	<p>1 Business Investment Case report of at least 10 pages in English on the fish silage Value Chain in Barbados delivered.</p> <p>The Business Case will outline key technical information for producing fish silage derived products, and the financial feasibility and potential returns on investment for fish silage and livestock feed and fertilizer production.</p>	<p>10 December 2024</p>
<p>7. Final Value Chain report</p>	<p>1 Final Value Chain report of at least 50 pages in English on the fish silage Value Chain in Barbados delivered</p> <p>Compile all the previous analysis and information gathered in a final report, on the basis of a standardized model provided.</p>	<p>10 January 2025</p>

8. Final report presentation and business plan discussion	<p>1 presentation of the Final Value Chain report in English delivered.</p> <p>Present the final report, findings and recommendations to national and international stakeholders in a final workshop. The stakeholders involved should include representative from: the fish processing industry, the poultry and swine industries, the upcoming FAO and China South-South Cooperation initiative on fish silage.</p>	22 January 2025
9. Final Consultancy Report	<p>1 compiled report of the Final Consultancy Report in English delivered.</p> <p>Annex all technical reports, consultations/ workshop reports, all the above report(s), awareness items developed, and photographs.</p>	12 February 2025

10. Application and Selection Procedure.

10.1 Interested consultants are invited to submit their Curriculum Vitae (CV), a declaration of availability, and a declaration of no conflict of interest.

10.2 CVs will be evaluated against the criteria described in Section 7, and contracting will be subject to a successful price negotiation with the selected consultant.

10.3 Interested consultants should submit their Application Cover Letter outlining why they believe they are best suited for this assignment and CV in PDF format by December 2023 to jobs@crfm.int and delmar.lanza@crfm.int.