

# INTRODUCING SUSTAINABLE BIOMASS BRIQUETTES AND MODERNIZED DRUM KILN FOR IMPROVED LIVELIHOODS AND WELL-BEING OF SMALL-SCALE FISH SMOKERS IN LAGOS, NIGERIA.

<sup>1</sup>Kafayat A. Fakoya, <sup>2</sup>Kafayat O.Ajelara, <sup>3</sup>Ayojesutomi Abiodun-Solanke, <sup>1</sup>Shehu L. Akintola.


<sup>1</sup>Department of Fisheries, Lagos State University, Ojo, Lagos State, Nigeria.

<sup>2</sup>Department of Zoology, Lagos State University, Ojo, Lagos State, Nigeria.

<sup>3</sup>Federal College of Fisheries and Marine Technology, Victoria Island, Lagos State, Nigeria.

[\\*kafayat.fakoya@lasu.edu.ng](mailto:kafayat.fakoya@lasu.edu.ng), [adikafayat@gmail.com](mailto:adikafayat@gmail.com)

# INTRODUCTION

- ▶ In West Africa, smoked fish is a delicacy and fish smoking, the most important and widely used method for preserving fish.
  - ▶ Preference for this method is further justified by scarcity of electricity for cold chain facilities and poor access to fishing communities for fresh fish.
  - ▶ Fish smoking is a female -centric occupation dominated by traditional or local hot smoke -drying technologies characterized with occupational hazards, fuel inefficiencies, drudgery and time-wasting.
  - ▶ Fish smoking is one of the principal causes of depleting forests and contributes to forest depletion and climate change.
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- ▶ Popular traditional or local fish smoking kilns such as smoking platforms or altars, barrels/drum kilns, mud kilns, Chorkor kiln, Altona kiln, Banda kiln and firewood as main fuel or energy source.
  - ▶ PAHs in smoked fish prepared by traditional methods may pose elevated cancer risks if consumed at high consumption rates over many years.
  - ▶ Home grown technologies have evolved but adoption by end users has been insignificant and very slow.
  - ▶ Technologies, processes and practices are not adopted or put into use by fish smokers operating in the small-scale fisheries value-chains.
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# INTRODUCTION




PHOTOS OF LOCAL KILNS AND FIRE WOOD

# INTRODUCTION

- ▶ Lethargy to change, accept innovations or receive new knowledge and skills that could improve efficiency, ergonomics, well-being, savings and income.
  - ▶ Women are seldom engaged in design, construction of equipment and technology transfer of improved or good practices which optimize fish smoking processes.
  - ▶ Concerted efforts to replace or substitute fuel woods with charcoal has not yielded significant efforts.
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# INTRODUCTION

- ▶ Substituting firewood with charcoal will not solve the problems of deforestation, greenhouse gas emissions and climate change.
  - ▶ Fish smokers are among those who undermine achieving SDG 7 (Affordable and Clean Energy), SDG12 (Responsible Production and Consumption) and SDG13 (Climate Action).
  - ▶ Improving this informal sector is strategic meeting many Sustainable Development Goals including SDG1 (Zero Hunger), SDG 2 (Zero Poverty), SDG 3 (Good Health and Well-Being), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, innovation and Infrastructure), and SDG 14 (Life Under Water) by 2030 and the African Union Agenda 2063.
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# INTRODUCTION


## Goal of the research:

- ▶ To develop a hybrid solar – biomass fish dryer for small-scale operators evolved to *alternative solid biofuel source to charcoal and firewood, and a local fish smoking kiln as prototype.*

## Specific objectives:


- ▶ To introduce and build capacity of operators in the use of modernized smoking kiln and environmentally –friendly solid biofuel.
- ▶ To ensure greater control over benefits: improved income, savings and investments, access, reduced drudgery, higher efficiency and conserve environmental resources.
- ▶ To assess comparative qualitative, quantitative, and economic costs and benefits of smoking kilns and different fuel sources.
- ▶ To improve hygiene, safety and quality of processed fish and promote access to new markets

# METHODOLOGY

- ▶ Activities implemented within the framework of the Gendered Design in (STEAM) in Lower- Middle Income Countries (LMIC).
  - ▶ Adopted a transdisciplinary approach leveraging on a survey of fish smokers.
  - ▶ A participatory action research with fisher folk and other stakeholders in a training workshop:
    - Demonstration of biomass briquettes.
    - Sensory evaluation of fish smoked.
  - ▶ Series of monitoring, evaluation and learning from fish smokers and a dissemination workshop .
  - ▶ WhatsApp platform with fish smokers to share information.
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# FINDINGS

- ▶ Research process was innovative, gender responsive and incorporated local knowledge
  - ▶ Output 1: Introduction to biomass briquettes.
    - Sensory evaluation of fish smoked with biomass briquettes indicated that it was best preferred to either charcoal and fuel woods,
    - Try -outs of smoking fish with briquettes demonstrated by fish smokers in videotape sessions.
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## FINDINGS

FISH SMOKED WITH BIOMASS BRIQUETTES IN A LOCAL DRUM KILN

# FINDINGS

- ▶ Output 2: Construction of prototype drum kiln to smoke fish.
  - Three performance evaluation processes.
- ▶ Output 3: A practical guide for small-scale fish processors on good practices.

# FINDINGS

## Insulated Prototype Drum Kiln

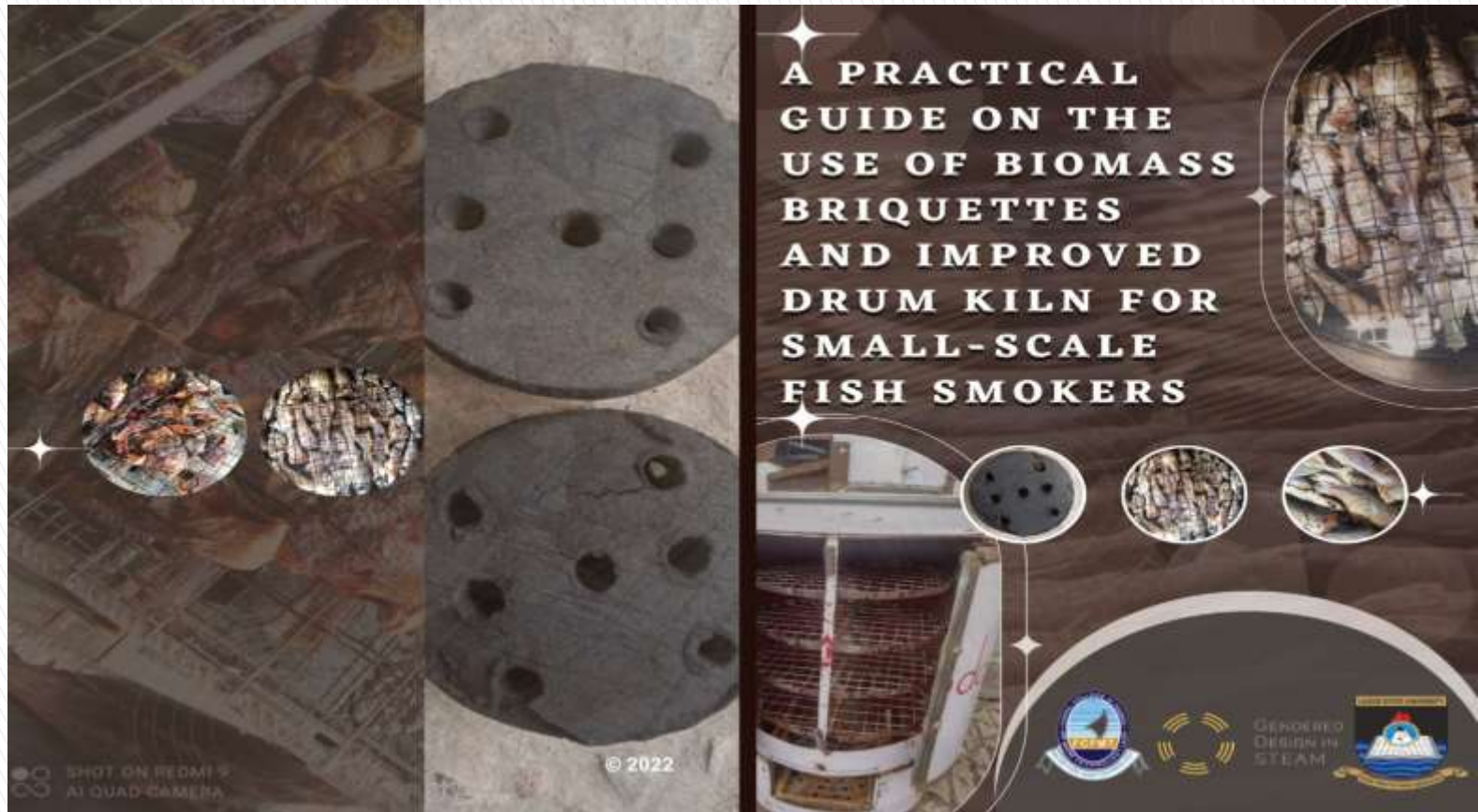


PROTOTYPE WITH DOORS OPENED




EXTERNAL VIEW OF PROTOTYPE

# FINDINGS



THE PRACTICAL GUIDE FOR FISH SMOKERS


# DISCUSSION

- ▶ Project activities and the outputs align with Para 7.2 and Para 7.5 of the SSF Guidelines on improving women's participation in the postharvest subsector.
  - ▶ Emphasis on promotion of environmentally sustainable practices within an ecosystem approach by deterring waste of inputs such fuel wood) in small-scale fish handling and processing.
  - ▶ Biomass briquettes are adaptable to existing traditional and local technologies.
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# DISCUSSION

- ▶ Outputs bear linked to recommendations of a SSF – VG National Workshop held May 9–11, 2022 at the Lagos State University.
- ▶ Project goals linked to Vulnerability to Viability (V2V) Global Partnership to enhance small-scale fisheries and fishing communities by demonstrating the potential use of the invasive water-hyacinth in briquette production and use for fish smoking and domestic use.  
(<https://twitter.com/V2VPartnership/status/1537167017945579521?s=20&t=zRjf838rPSsubKm84P4l0A>).

# CONCLUSION

- ▶ Co-production of activities all the way.
  - ▶ Adoption of biomass briquettes.
  - ▶ Low-cost prototype drum.
  - ▶ Practical Guide.
  - ▶ Leveraged on Linkages, Networks and Partnerships.
  - ▶ Capacity building in research and delivering development projects.
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# RESOURCES

- ▶ <https://lnkd.in/gzWcKzBN>
- ▶ [https://www.linkedin.com/posts/kafayatadetounfakoya\\_gendereddesigninsteamm-carleton-fish-activity-6975221118538313728-lUt1?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/kafayatadetounfakoya_gendereddesigninsteamm-carleton-fish-activity-6975221118538313728-lUt1?utm_source=share&utm_medium=member_desktop)
- ▶ [https://www.linkedin.com/posts/kafayatadetounfakoya\\_training-biomass-activity-6969468932583821312-czYO?utm\\_source=share&utm\\_medium=member\\_desktop](https://www.linkedin.com/posts/kafayatadetounfakoya_training-biomass-activity-6969468932583821312-czYO?utm_source=share&utm_medium=member_desktop)

# RESOURCES



Project ID\_57 proudly introduces

## SUSTAINABLE BIOMASS ENERGY SOURCE AND FISH SMOKING KILN



GENDERED  
DESIGN IN  
STEAM

**INSULATED DRUM OVEN**

**ENVIRONMENTAL SUSTAINABILITY**  
Improved Fuel Efficiency

**ECONOMIC SUSTAINABILITY**  
100% Locally Sourced Materials  
Low cost

**SOCIAL SUSTAINABILITY**  
Low budget  
Hygienic  
Improved Income  
Simple to construct and operate

**CARBONIZED BRIQUETTES**

**ENVIRONMENTAL SUSTAINABILITY**  
Improved Fuel Efficiency  
Fish safe - low heat

**ECONOMIC SUSTAINABILITY**  
100% locally sourced  
ECONOMY PROMOTES  
improved income

**SOCIAL SUSTAINABILITY**  
Easy to use

Our innovations are adapted on the priceless traditional and local knowledge held by our women, which are simply 'too big to ignore!'

Contact details for further inquiries:  
pde@afaya@gmail.com  
+234 802 583 4358  
+234 817 172 0430  
+234 803 674 9648

THANK YOU !