NATIONAL TO REGIONAL PERSPECTIVES ON FLW REDUCTION STRATEGIES AND OPPORTUNITIES TO IMPROVE NUTRITION AND ADDRESS CLIMATE CHANGE

Gaspar Cuambe, Country Director, GAIN Mozambique

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BACKGROUND: NUTRITION & ENVIRONMENTAL CHALLENGES IN MOZAMBIQUE

**Nutrition Context**
- Mozambique ranked third worst in global nutrition indices in 2021 (among 113 countries)
- Moderate or severe food insecurity is at 74%
- Chronic malnutrition affects 37.5% of children under 5yo, with 28% of children under 2yo achieving minimum diet diversity
- Nutrition adequacy costs 161% of household food expenditure; 54% of households in Mozambique cannot afford a nutritious diet that meets minimum nutrient needs.
- Fresh fruit, vegetables, meat, and eggs remain in short supply; 55% eat no meat, fish, or eggs
- Prevalent health issues: anaemia among women and children, prevalence of diabetes increasing
  - 52% of women in reproductive age are Anaemic; 73% of children under 5yo are anaemic.
- Malnutrition costs Mozambique almost 11% of its GDP – equivalent to US$ 1.7 billion each year.

**Environmental Context**
- Prominent natural hazards: **floods, droughts, tropical cyclones**
  - Floods and heavy precipitation during rainy seasons of 2016-17 to 2019-20 damaged 1.5m ha of crops
  - 30 drought-prone districts in Mozambique already struggle with access to water supply for consumption, livestock, and irrigation
- Long coastline, chronic poverty, inadequate access to health services, and high reliance on agriculture make the population highly vulnerable to climate shocks
  - Particularly low-lying coastal and rural communities (2/3 of population)
- 70% of national GHG emissions originate from LULUCF (land use, land use change, forestry)
FOOD LOSS & WASTE IN MOZAMBIQUE I

• Generally, there exists a lack of comprehensive data on quantity and quality of FLW

• Mozambican farmers lose as much as 27.3% of total production volume

• In terms of food supply chain stage, FLW seem to be particularly large at production, postharvest handling/storage, processing/packaging stages

• Drivers of FLW in animal source food (ASF) value chains:
  • Sub-optimal processing techniques
  • Insufficient storage facilities
  • Inadequate transportation conditions / lack of cold chains
FOOD LOSS & WASTE IN MOZAMBIQUE II

- The need for FLW reduction is mentioned in many national policies

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<thead>
<tr>
<th>Policy</th>
<th>Reference / relevance to FLW</th>
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<tr>
<td>Aquaculture Development Strategy 2020-2030</td>
<td>• Enhancing processing, handling, storage, and hygiene as strategies to promote development in aquaculture</td>
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<td>Agrarian Development Plan</td>
<td>• Reduced post-capture loss in wild-fishing as a strategic pillar to increase production, productivity, and agrarian competitiveness</td>
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<td>• Goal to reduce PHL by 50% in rice, maize, sesame, and other strategic value chains</td>
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<td>Fisheries Master Plan</td>
<td>• Prioritising reduction of small-scale post-capture losses to increase production volume</td>
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<td>• Enhancing infrastructure to reduce risk of loss of quality and quantity of fisher products</td>
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<td>National Adaptation Plan</td>
<td>• Recognizes FLW as major challenge to food and nutrition security in Mozambique</td>
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<tr>
<td>Nationally Determined Contribution</td>
<td>• References to fish and livestock losses during cyclones</td>
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<td>• Dissemination of improved technologies to reduce PHL</td>
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- However, there remains an investment gap to realize the ambitions written into national policy

- Policies, strategies, and investments to reduce FLW . . .

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<th>Will cause . . .</th>
<th>Which can help to . . .</th>
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<tbody>
<tr>
<td>Increased quantity, availability, and safety of nutritious foods throughout the year</td>
<td>Mitigate current FLW equivalent to 36% of daily calorie intake (809 kcal/cap/day) (Aragie et al, 2018)</td>
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<td>Increased production volume and income for producers</td>
<td>Mitigate the current 20.6% loss of agricultural income due to FLW (Aragie et al, 2018)</td>
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<td>More efficient use of land and natural resources</td>
<td>Lower emissions and the ecological footprint of food consumption, currently 0.7 global hectare/capita (Food Systems Dashboard)</td>
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OVERVIEW OF A1: IMPROVING CONSUMPTION OF ANIMAL SOURCE FOODS (ASF)

THE PROJECT AIDS TO IMPROVE DIET QUALITY BY INCREASING THE CONSUMPTION OF ANIMAL SOURCE FOODS (ASF) OF 1.1 MILLION BOP CONSUMERS. ASF FOCUSES ON THREE FOOD GROUPS AND INTERVENTIONS IN THREE CROSS-CUTTING MAIN PILLARS:

1. **Enabling environment**: food policies in three priority areas around ASF: food safety and quality, fiscal measures and incentives, and environmentally sustainable policy.

2. **Desirability**: demand generation messages will leverage the desire for variety among those for whom dried fish is their only regularly consumed ASF.

3. **Accessibility and affordability**: increase private-sector-led last-mile distribution system, support distribution networks by investing in processing and cold chain.
OVERVIEW OF NFP5.1

• GAIN’s *Nourishing Food Pathways (NFP)* programme aims to support the implementation of country food system pathways towards improving the consumption of nutritious and safe foods for all, especially the most vulnerable, produced in a sustainable way.

• The objective of **Workstream 5.1** is to increase access to sources of protein and micronutrients while minimizing environmental impact in 3 countries: Mozambique, Bangladesh, and Indonesia.

- **NFP5.1 in Mozambique** focuses on greening existing ASF projects in fish & poultry value-chains. The focus of the interventions is to harness the avoidable food losses and waste for efficient food processing and distribution systems and enhanced access to safe and nutritious foods through:
  - Improved resource efficiency: by addressing simultaneously the issues of waste of natural resources that are critical for sustainability and waste of resources and efforts invested in supply chains.
  - Reduction of GHG emissions associated with food waste.
  - Enhanced food safety through reduction of ASF products spoilage.
  - Increased access to affordable ASF.

Source and deploy innovations and actions (incl. policy interventions as well as new & existing technologies), to reduce environmental impacts

Reduce the environmental impact of certain foods while scaling up access e.g. reductions in food loss and waste, improved production practices.

Greater access to priority sources of high-quality protein and micronutrients in 3 countries; strengthened global action for sustainable food systems transformation.
## How GAIN Achieves Nutrition & Environment Co-Benefits: Value Chain Selection

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<th>Criteria</th>
<th>Nutritional</th>
<th>Environmental</th>
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<tr>
<td><strong>Aim to Achieve</strong></td>
<td>Support positive nutrition outcomes, consumption of foods rich in priority micronutrients, sustain existing healthy consumption patterns</td>
<td>A measurable reduction in environmental impact. E.g.: • Reduced environmental impact per unit of food due to value chain improvements • Reduced food loss and waste in value chain</td>
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<tr>
<td><strong>Rationale for Selection</strong></td>
<td>Consumption of ASFs is often the most efficient way to address micronutrients deficiencies due to protein, iron, zinc content</td>
<td>Focus on chicken and fish value chains, which have lower environmental impact than other ASF</td>
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### Priority Nutritious Foods

A1 & NFP5.1 - Climate change & env. sustainability

### Nutritional Criteria

- Focus on chicken and fish value chains, which have lower environmental impact than other ASFs.
OPPORTUNITY I: IMPROVING DRYING TECHNOLOGY & STORAGE TO MINIMIZE FLW IN FISH VALUE CHAINS WHILE INCREASING PRODUCT QUALITY & ACCESS

- **Objective of NFP5.1 in Mozambique:** understand the environmental benefits of different interventions in fish value chains under ASF that are capable of achieving triple wins.

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<th>Activities under Consideration</th>
<th>Intended Outcomes</th>
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| **Investments in cold-chain systems:** freezers and/or solar-powered freezers, solar-powered icemakers, cold rooms, and refrigerated transportation. | • Reduced losses and waste associated with spoilage during distribution and storage  
• Expand distribution of fresh fish and poultry in under-served location |
| **Promotion of improved solar tent dryers for dried fish** | • Reduced losses associated with suboptimal processing techniques  
• Increased shelf-life and overall quality and safety of dried fish |
| **Improved storage facilities for dried fish:** integration of environmentally friendly components such as rainwater harvesting systems and/or solar powered water pumps into the construction designs of specialised warehouses. Roof insulation and long duration pallets | • Reduced losses associated with poor storage facilities.  
• Improved overall quality and safety of dried fish  
• Water saving through capture and use of rainwater  
• Reduce energy or use of renewable energy sources |
OPPORTUNITY II: DISSEMINATION OF NFP5.1 FINDINGS FOR GREATER REGIONAL APPLICATIONS

- To help address information / data bottlenecks to achieving SDG12.3 in regional context, as literature on impact & evaluation of FLW interventions is sparse

- NFP5.1 activities require strong M&E focus. For example:
  - Evaluation of changes to post-harvest loss of fish when interventions are implemented compared to a baseline
  - LCA of fish before and after implementation of interventions / activities

- **Opportunity for greater dissemination:** Findings and outcomes of activities can build a body of wider knowledge of how such interventions can improve the environmental sustainability of priority proteins. In turn, this helps inform a green business case which could make the innovations easier to scale in Mozambique and elsewhere.
Thank You