ANNEXES

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Title: Transformative bottom-up change in highly dynamic food environments: Learning from Living Labs in Africa

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ANNEX 1 and 2: Overview of data collection

ANNEX 1: Quantitative data collection

Annex 1 synthesises the quantitative data collection work, led by Work Package 2 (WP2) on food consumption and healthy nutrition of the Healthy Food Africa project. WP2 co-developed the analytical framework and common indicators and supported FSLs to gather and analyse baseline and endline data on food environments, food choices, dietary patterns and nutrition outcomes. Below is a description of the specific research design and data collection methods employed by different FSLs.

Kisumu Food System Lab

The study employed a repeated cross-sectional design, with household surveys conducted at baseline (March–April 2022) and endline (August–September 2024). The baseline included 510 randomly selected households, while the endline covered 800 households. The study population consisted of women of reproductive age (WRA) and their children aged 6–23 months, assessed as mother–child pairs. This population was selected due to their increased nutritional needs and vulnerability to malnutrition. Moreover, dietary diversity among women and children is associated with micronutrient intake, and thus diet quality and nutrient adequacy (Gómez et al., 2024; Molani-Gol et al., 2023).

During the intervention period, households were assigned to either intervention or comparison groups. The intervention group received a comprehensive package of food systems interventions comprising: (i) establishment of home and urban gardens, (ii) an aquaponics system integrating fish and vegetable production, (iii) strengthening of value chain linkages and governance mechanisms along the fish and vegetable value chains, and (iv) nutrition education and behaviour change communication. The comparison group received no intervention.

Data collection at both time points used a semi-structured questionnaire capturing women's and children's dietary practices and household garden ownership. Dietary intake was assessed using the multiple-pass 24-hour quantitative recall method, administered on two non-consecutive days for at least half of the participants (Gibson and Ferguson, 2008). The 24-hour recall tool used followed Food and Agriculture Organization (FAO) and World Health Organization (WHO) guidelines for assessing dietary diversity in WRA, infants, and young children (FAO, 2021; WHO & UNICEF, 2021). All foods and beverages consumed during the previous 24 hours were recorded.

Data were analysed in R (v4.4.2). Outcomes included household garden ownership, Dietary Diversity Score[1] for women (WDDS) and children (CDDS) and Minimum Dietary Diversity[2] for women (MDD-W) and children (MDD-C). Dietary diversity indicators were generated from the 24-hour recalls by counting the number of food groups consumed.

Rwamwanja Food System Lab

In Rwamwanja no quantitative baseline survey was conducted. Endline assessment relied on qualitative focus group discussions (FGDs), supplemented by FSL reports and project deliverables. See Annex 2 for details on interventions and qualitative sources.

Fort Portal Food System Lab

The study employed a repeated cross-sectional design, with quantitative data collected at baseline (May 2022) and endline (October 2024). At baseline, 622 randomly selected households were surveyed, while 480 households were interviewed at endline. The study population consisted of women of reproductive age (WRA) and children aged 6–59 months.

Data were collected using a semi-structured household questionnaire that captured maternal, infant, and young child feeding (MIYCF) practices as well as home gardening. Dietary intake of both women and children was assessed using a 24-hour recall method following FAO and WHO guidelines.

Data analysis focused on two primary outcomes: (i) Minimum Dietary Diversity for women (MDD-W) and children (MDD-C), and (ii) household ownership of kitchen or vegetable gardens at baseline and endline.

Cotonou Food System Lab

This study conducted a cluster randomized controlled trial in 12 public primary schools with canteens. Clusters were schools (randomized at the school level), with equal allocation to intervention and control groups. Schools were drawn from two communes in southern Benin (Abomey-Calavi and Sèmè-Podji). The study population comprised school children aged 7–14 years. A total sample of 802 children was calculated using the Charan and Biswas (2013) formula, adjusted for design effect and attrition. Schools were randomly selected from the governmental Integrated School Feeding Program, with equal allocation to intervention and control groups. Within schools, children were randomly chosen from grades 3–5. Baseline data were collected between December 2021 and February 2022, and endline data between June and July 2024.

Data collection combined questionnaires, interviews, observations, and 24-hour dietary recalls. Outcomes included food group scores (FGS) for canteen food diversity, a summary hygiene index (SHI) for food safety, and children's knowledge, attitudes, and practices (KAP) regarding nutrition. Dietary Diversity Score (CDDS) and Minimum Dietary Diversity (MDD-C) for children were calculated from the dietary recalls. Teachers, canteen cooks, and some parents participated in the intervention and contributed qualitative implementation information and canteen staff observations were used to compile FGS and SHI measures.

[1] Dietary Diversity Score is the average number of different food groups consumed by WRA (15–49 years) and children the previous day and night (24 hours). A score of 5 or more (out of 10) food groups for WRA and a score of 5 or more (out of 8) food groups for children are used as cut-offs to indicate nutrient adequacy.

[2] Minimum Dietary Diversity is the proportion of WRA who achieve the recommended minimum of 5/10 food groups and proportion of children who achieve the recommended minimum of 5/8 food groups.

ANNEX 2: Qualitative data collection

Annex 2 describes how qualitative evidence was collected and analysed across FSLs to document processes and outcomes of participatory action research (PAR)-based living-lab interventions, and how these materials informed cross-case learning. Our approach follows a multi-case PAR design with an ethnographic orientation embedded in real-world living labs. The qualitative and ethnographic work was conducted mostly through Work Package 7 (WP7) of Healthy Food Africa on transformational impact, scalability and exploitation.

Design and chronology

The research design and chronology in each FSL consisted of the following steps: 1. Introduce Theory of Change (ToC) and map initial pathways (2020–early 2021); 2. Co-construct ToC through stakeholder workshops and online FGDs (Apr–Jun 2021); 3. Iterate and deepen ToC and stakeholder mapping (late 2021–2022); 4. FSL-level baseline diagnosis and intervention co-design (2021–2022); 5. Ongoing PAR accompaniment, reflection, and endline sense-making (2022–2025).

Qualitative sources in FSL analysis

- ToC documents (FSL-specific narratives, outcome maps, assumptions, actor roles), produced jointly by FSL teams and WP7 during workshops and meetings.
- Stakeholder workshop and meeting notes (local multi-actor sessions for co-design, policy dialogues, education strategy co-creation), generated by FSL leads with WP2/WP7 support.
- Online interviews and check-ins with FSL leaders (periodic, semi-structured) conducted by the author team to document implementation progress and contextual shifts.
- Internal project outputs used as an audit trail (deliverables, interim reports, blogs, impact-assessment strategies, meeting summaries).
- Annual consortium meetings with all WP and FSL partners (consisting of panel discussions, collaboration sessions, project exchanges, and evaluations)
- Cross-WP summaries and final reporting (syntheses of activities, impact pathways, lessons learned) used for triangulation.

Rwamwanja Food System Lab (qualitative inputs and intervention overview)

The Rwamwanja refugee settlement FSL, led by Finn Church Aid, organised smallholder maize farmers (approximately 70 percent refugees) into 36 producer associations, consolidated into 10 marketing clusters and a registered cooperative, and delivered community-based extension via 10 Village Enterprise Agents (VEAs). Interventions combined training in agronomy and post-harvest handling and quality control, collective bulking and marketing, and the commissioning of a local maize mill to add value (flour and bran) and anchor processing locally. Nutrition-sensitive actions (kitchen gardens and community nutrition education) complemented the value chain work to support healthier diets. Qualitative material used in this paper draws on the FSL's ToC framework, stakeholder workshop and meeting notes, VEAs' field reports, and milling and price logs, supplemented by beneficiary accounts.

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