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Food Environment Methods, Tools and Metrics to Support Healthy Diets in Low- and Middle- Income Countries

Shauna Downs, Rutgers University and USAID
Advancing Nutrition

Christopher Rue, USAID

Sarah McClung, USAID Advancing Nutrition

Noni Alexander, USAID Advancing Nutrition



Ipsos Nigeria Limited, 2022

<https://www.anh-academy.org/academy-week/2023> | #ANH2023 | @NutritionForDev



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Agenda for the Session

1. Discuss food environment key concepts and definitions
2. Discuss why understanding food environments is important for food systems programming to improve diets and nutrition
3. Review food environment assessment options—progress to date
4. Practice using the food environment assessments package
5. Plenary discussion



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Learning Lab Objectives

- Describe food environments, components of food environments, and market-based food environment assessments included in this study.
- Describe the methodologies for conducting the seven market food environment assessments in each of the markets within this study, including data collection and analysis procedures.
- Practice market-based food environment assessments.



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Food Environment: Key Concepts and Definitions

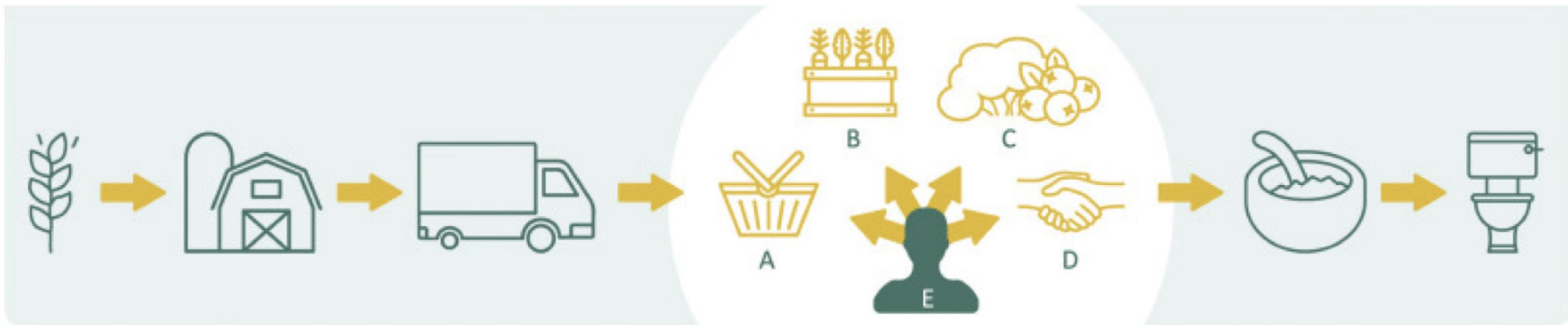


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Food Environment

The space in the food system where consumers directly procure food.



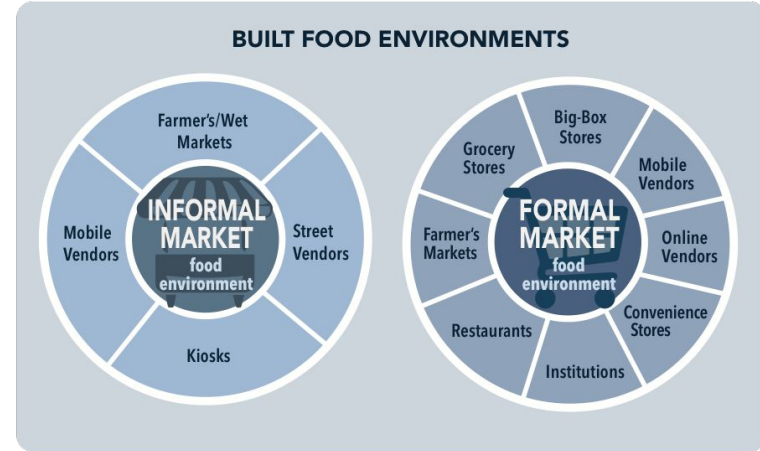
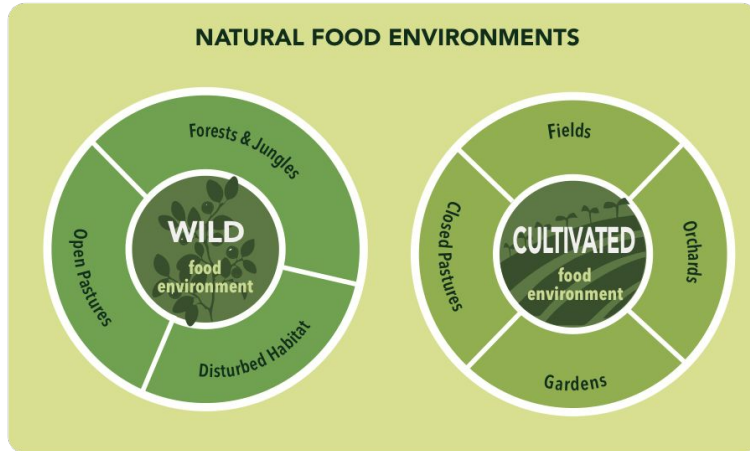
Source: Turner et al. 2018



Types of Food Environments

- There are different types of food environments.
- Markets are major channels from where households around the world are increasingly purchasing foods.

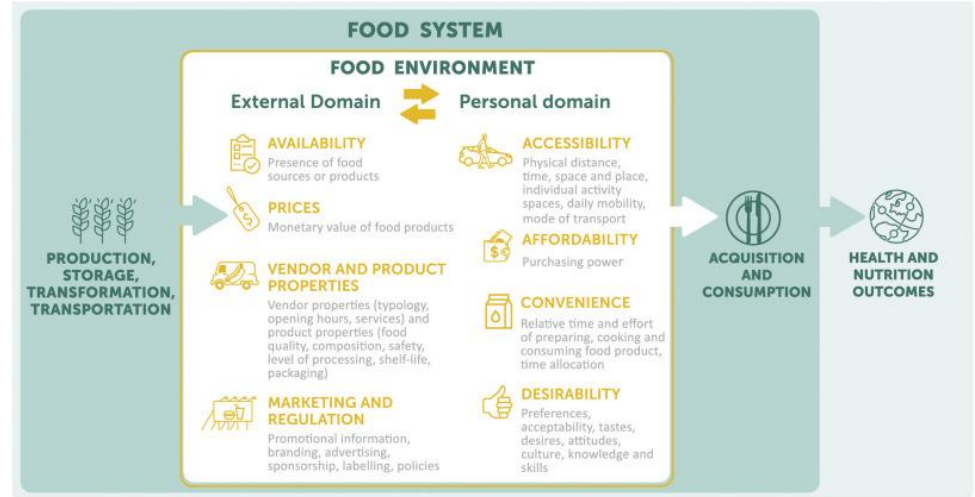
FOOD ENVIRONMENT TYPOLOGIES



Source: Downs et al. 2020

Food Environment Domains

- Food environments can be classified by *domains*—external and personal.
- External domain comprises dimensions *outside* of an individual's influence.
- Personal domain comprises dimensions *within* an individual's influence.



Source: Turner et al. 2018



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Global Food Environment Methods, Metrics, and Tools



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Assessment Terminology

- Methods
- Tools
- Metrics

****This classification system is not always distinct with specific measures not always falling neatly between tools and metrics.*



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Methods

- General procedures for collecting and analyzing quantitative and qualitative data
- Examples:
 - Surveys
 - Observational analysis
 - Mapping
 - Market-place audits





Tools

- Also known as research instruments, tools are specific methods developed for collecting and analyzing quantitative and qualitative data.
- Tools are often validated based on specific methods.
- Examples:
 - Market Information Systems
 - Produce Desirability Tool



Metrics

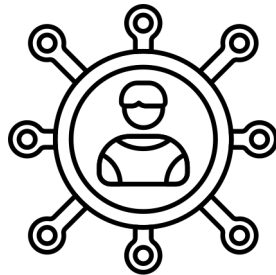
- Specific tools for collecting and analyzing data that result in an indicator or score
- Examples:
 - Cost of Diets
 - Market Diversity Index





Broader Landscape of Global Food Environment Methods, Tools, and Metrics

- Participatory methods to examine food environments
 - e.g., Photovoice and other community-engaged methods
- Examining activity spaces
 - Centering the way in which people interact with their food environments
- Key areas of work currently under development
 - Sampling approaches, decision tools for food environment assessment selection, personal food environment assessments





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Understanding Food Environments for Food Systems Programming to Improve Diets and Nutrition Outcomes



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Market-Based Food Environment Assessments: Background and Goals

Study Aim: Develop low resource, feasible, and suitable guidance and tools to assess food environments and capture data that informs actions

GATHER INFORMATION



APPLY INFORMATION

Comprehensively characterize dimensions of food environments

Ensure assessments are relevant for low- and middle-income contexts

Ensure assessments support uptake with clear instructions and tools

Explore information in conjunction with production and consumer demand data

Identify barriers and opportunities for food systems approaches to improve diets

Relate food environments to diet, nutrition, and health outcomes



Goals of Conducting Market-Based Assessments

Characterize dimensions of food environments

Identify barriers and opportunities for supporting programmatic aims to improve diet quality, food security, and nutritional status

Compare food environments between different locations

Evaluate how food environments are changing over time

Monitor the impact of interventions, programs, or policy on food environments

Relate food environments to dietary, health, and nutrition outcomes



Market Food Environment Assessments Tested

Assessment	Primary Question Answered
1. Market Mapping *	What types of food vendors are available in each market and the surrounding area?
2. Seasonal Calendar of Availability	Which foods (species) are available in each market throughout the year?
3. Market Diversity Index *	Which food groups are represented and/or missing at each market?
4. Healthy Eating Index of Food Supply *	Are sufficient quantities of each food group available to meet recommended intakes?
5. Cost of a Healthy Diet *	What does it cost to meet dietary recommendations?
6. Environmental Profile of a Community's Health	How prevalent are food advertisements and what types of foods are they promoting?
7. Produce Desirability Tool	Are select fruits and vegetables for sale in the markets appealing and desirable to consumers?
*Adapted for use in low- and middle-income countries	

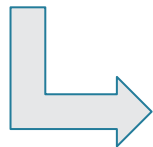


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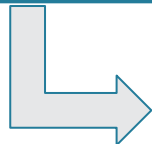
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Phase I: Assessment Identification

STEP 1: Landscape
assessment of market food
environment assessments



STEP 2: Ranking exercise with
internal panel on market food
environment assessments suitable for
LMICs



STEP 3: Survey with external
experts for most suitable market
food environment assessments
for LMICs



OUTCOME: Evidence-based
priority list of food
environment assessments for
LMICs



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Study Countries and Timelines



Liberia

September–December 2021



Honduras

June–August 2022



Nigeria

October–December 2022



Timor-Leste

January–March 2023

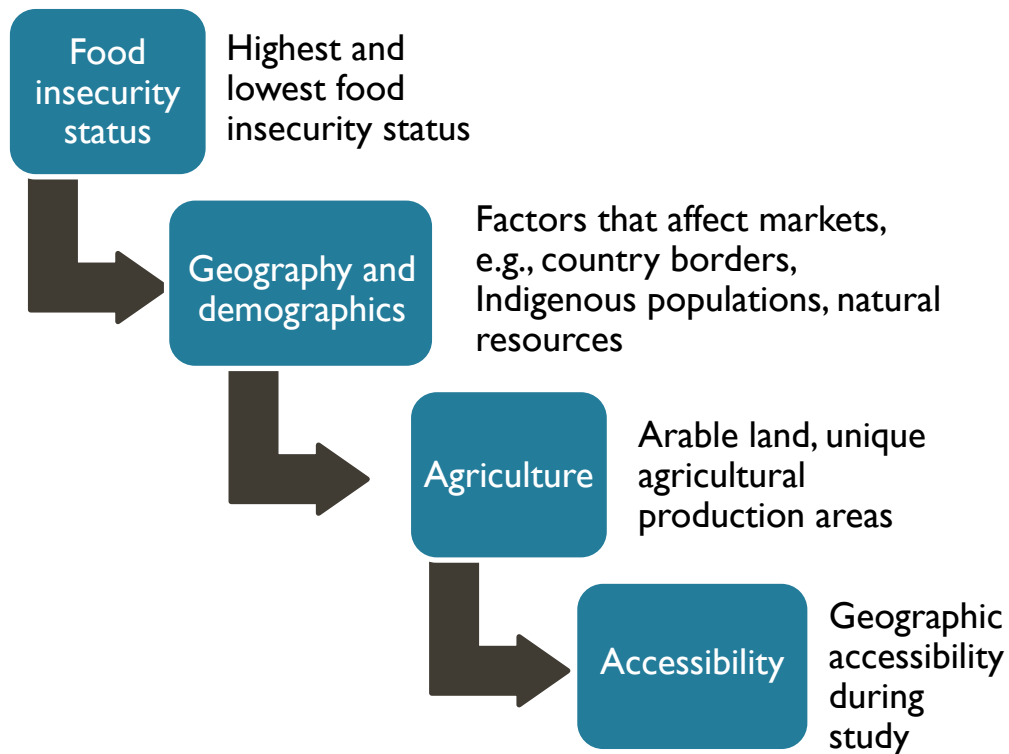


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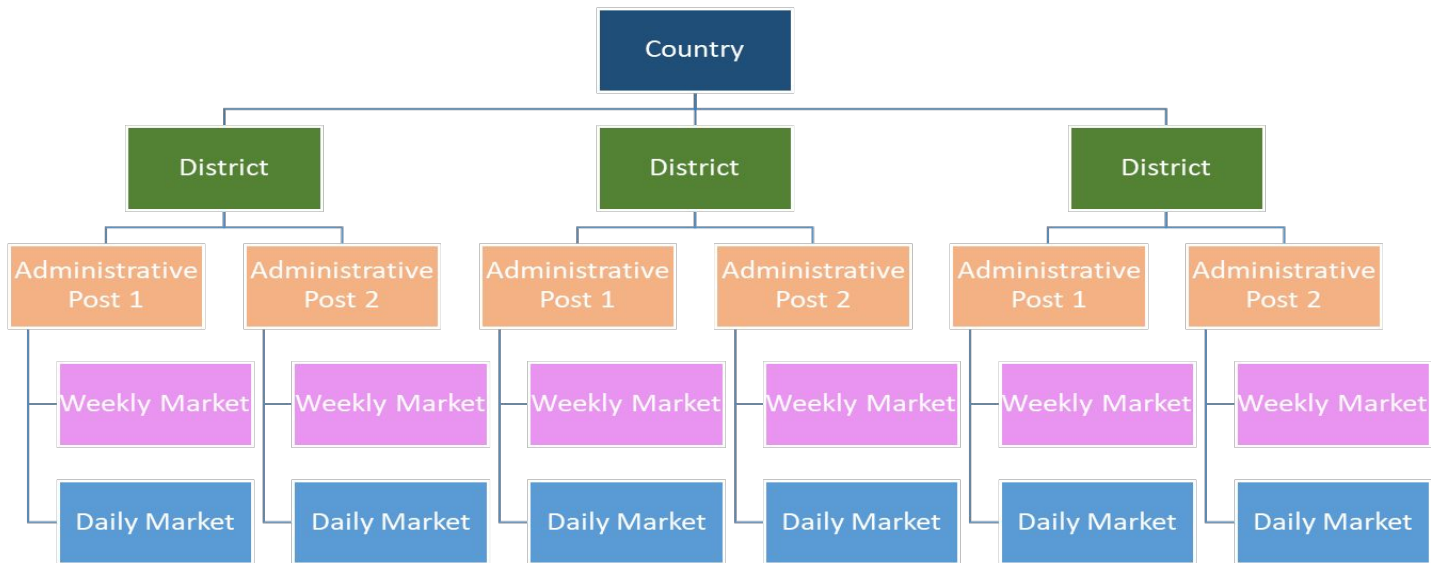
Geographic Selection

- State/district/department
- Within each district, two sub-districts will be chosen to narrow the geographic scope.
- 1 weekly and 1 daily market will be selected for each sub-district for a total of **12 markets**.





Overview of Sampling





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Social Participatory Mapping



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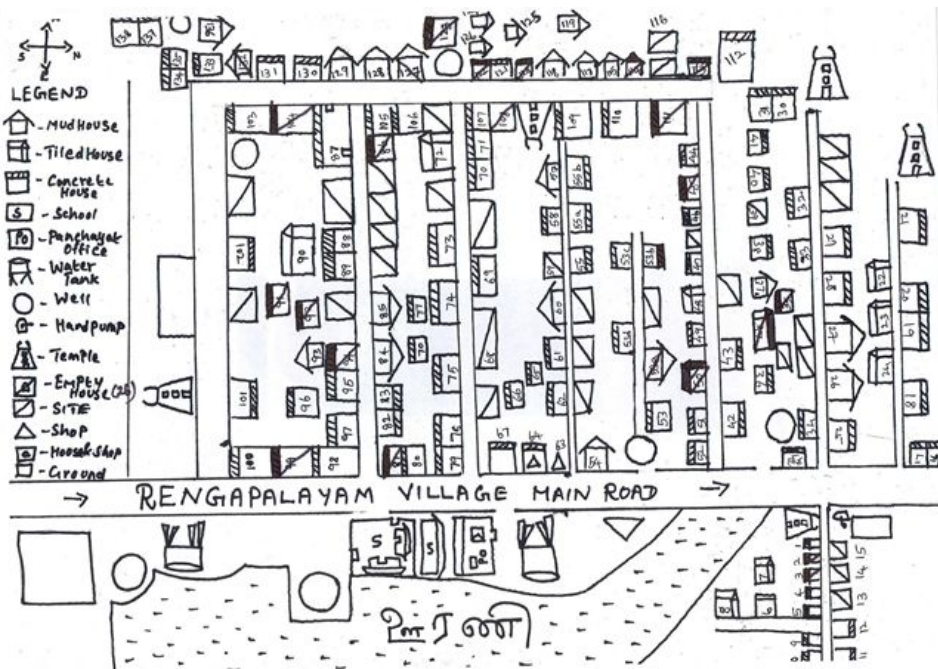
Social Participatory Mapping for Our Purposes

Food Environment Assessment	Food Environment Dimensions	Objective(s)
Social Participatory Mapping *Formative step	<ul style="list-style-type: none">● Accessibility● Affordability● Convenience● Desirability	<ul style="list-style-type: none">● Provide a high-level context of the regional food environment through consumer focus groups.● Document the types of markets or vendors consumers access in a given locality.● Document why and how often these markets/vendors are accessed.● Document mode of transportation and time spent to access the markets/vendors.



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Source: Pelto and Armar-Klemesu, *Focused Ethnographic Study Manual*, 2014; Gittelson et al. *Rapid Assessment Procedures*, 1998; Dhan Foundation, *Social Mapping*, 2012.



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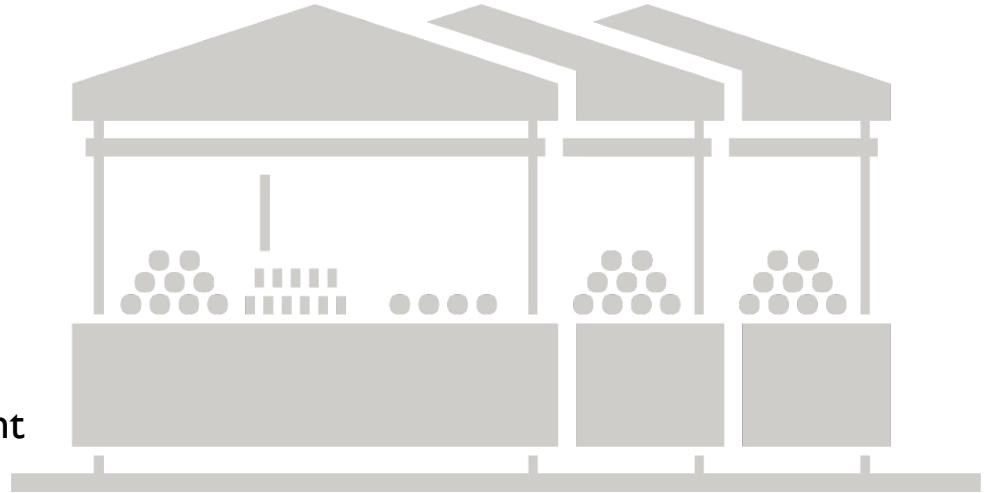


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ASSESSMENT # 1 MARKET MAPPING DATA COLLECTION INSTRUCTIONS

Guidelines for Market-Based Food Environment
Assessments



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Objectives

- The **overall objective** of the Market Mapping assessment is to provide context of the food environment in a specified area.
- The **specific objectives** of the Market Mapping assessment are to document the—

Characteristics of the community, including infrastructure

Number and types of market food environments in a community

Distance of the market from specific community features

Types/numbers of vendors within selected markets



Research Questions

What are the different types and quantities of food markets in a given community?

What are the different types and quantities of vendors in a given market and, what are their working hours?

How far are markets from specific community features?

How do market characteristics vary with locality (comparison between markets in the selected locations within study area and between weekly and daily markets)?



Methodology

Community-Level (Phase 1)

- Sampling unit: community level
- Goal: provide overview of market food environments and community characteristics
- Methodology: Audit using the data collection sheet for Market Mapping (**Annex 5**)



Market-Level (Phase 2)

- Sampling unit: market level
- Goal: characterize types and quantities of vendors in markets
- Methodology: Audit using the data collection sheet for Market Mapping (**Annex 6**)



Research Planning

Procure Maps

- Procure maps at community level



Identify Markets

- Map locations of markets using directories
- List days and hours of operations of markets at the community level using directories



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ASSESSMENT #2 SEASONAL FOOD AVAILABILITY CALENDARS

Guidelines for Market-Based Food
Environment Assessments



Credit: <https://www.bucketlistly.blog/posts/things-to-do-one-day-dili-timor-leste>



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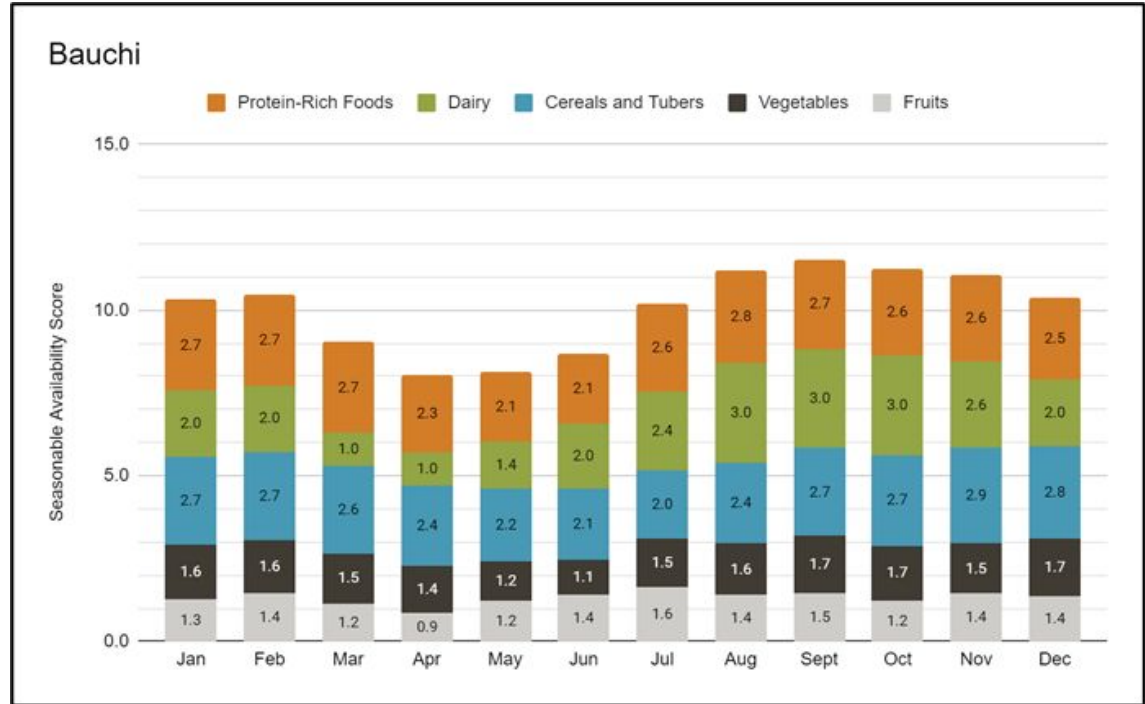


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Objectives

- The **overall objective** of Seasonal Food Availability Calendars is to visually depict the availability of fresh foods that are locally available in markets during all months of the year.
- A **secondary objective** is to identify patterns of seasonal changes in availability.





Research Questions

What are the temporal patterns and fluctuations in fresh food availability with regards to market supply?

When are the least fresh foods and least nutrient-dense food available at markets?

When are the most fresh foods and nutrient-dense foods available at markets?

How does availability of fresh foods vary with locality (comparison between markets in the selected geographic locations and between weekly and daily markets)?

Methodology: Focus Group Discussions with Market Vendors

Free Listing Exercise

Verification of Food Names

Scoring Exercise of Seasonal Availability



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ASSESSMENT # 3 MARKET FOOD DIVERSITY INDEX (MFDI)



Source: SPRING



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Market Food Diversity Index: Availability

Determine the availability of foods categorized by food groups using a food environment inventory

Diet Quality-Questionnaire Food Groups (DQQ) (29)		Minimum Dietary Diversity—Women (MDD-W) Food Groups (10)
Foods made from grains	Processed meats	Grains, white roots and tubers, and plantains
Whole grains	Unprocessed red meat (ruminants)	Pulses (beans, peas and lentils)
White roots/tubers	Unprocessed red meat (non-ruminants)	Other vitamin A-rich fruits and vegetables
Legumes	Poultry	Dark green leafy vegetables
Vitamin A-rich orange vegetables	Fish and seafood	Other vegetables
Dark green leafy vegetables	Nuts and seeds	Other fruits
Other vegetables	Packaged ultra-processed salty snacks	Eggs
Vitamin A-rich fruits	Instant noodles	Milk and milk products
Citrus	Deep fried foods	Meat, poultry and fish
Other fruits	Fluid milk	Nuts and seeds
Baked sweets	Sugar-sweetened beverages (soft drinks, sports drinks)	
Other sweets	Fruit juice and fruit drinks	
Eggs	Sweet tea/coffee/cocoa	
Cheese	Fast food	
Yogurt		



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Objectives

The **overall objective** of the Market Food Diversity Index is to determine the availability of foods, categorized by food groups, through an inventory and audit.



Source: harvestplus.org



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Research Questions

What is the availability of foods categorized on the basis of the food group classifications of MDD-W and DQQ?

Which food groups are most prevalent and which food groups are least prevalent at market?

How does the availability of food groups vary by locality (comparison between markets in the selected geographic locations and between weekly and daily markets)?



Methodology: Observational Research

Market Audit/Inventory: Conduct audit + inventory of foods on the basis of the 29 unique food group categories (derived from the DQQ and MDD-W food groups)

Market-level Audit: 2 markets at community level/12 per country. Place a check mark in the data collection sheet to indicate the presence of a food and provide one example of that food.

Vendor-level Inventory: 10 randomly selected food vendors per market. Complete an inventory of each vendor's offerings by writing each available item in the representative food category in the data collection sheet.

Data analysis to calculate MFDI (based on DQQ and MDD-W food groups)



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ASSESSMENT #4 HEALTHY EATING INDEX (HEI)

ASSESSMENT #5 COST OF A HEALTHY DIET



Credit : SPRING



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Objectives

The **overall objective** of the HEI of Food Supply is to evaluate how aligned the food supply is in a given locality to a selected quantitative Food Based Dietary Guidelines (FBDG) to support diet quality.

The **overall objective** of the CoHD is to evaluate the minimum cost of consuming a diet aligned to FBDGs.



Source: fao.org



Research Questions

How well do available foods align with quantitative recommendations of selected FBDG?

What is the minimum cost of meeting FBDG and the cost of meeting recommendations for specific food groups?

What food groups are available and affordable, and which are lacking (or more expensive) in a given food supply?

How does the availability and affordability of foods and food groups vary with locality (comparison between markets in the selected geographic locations and between weekly and daily markets)?



Comparison of HEI and Cost of a Healthy Diet (CoHD)

HEI evaluates the availability dimension of food environments.

CoHD evaluates the price and affordability dimensions of food environments.

HEI is benchmarked on quantitative FBDG.

CoHD is benchmarked on quantitative FBDG.

HEI evaluates the quantity of food groups available in a given food supply based on FBDG.

CoHD evaluates how much it costs to eat a recommended diet based on FBDG.

HEI collects information on quantities of available foods based on FBDG.

CoHD collects information on prices of foods based on FBDG.

Methodology: Audit + Interviews

Select Food Based Dietary Guidelines (FBDG)

Phase 1: Market Audit

Phase 2: Vendor Interview

Calculate HEI Scores and *modified* CoHD



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ASSESSMENT #6 ENVIRONMENTAL PROFILE OF A COMMUNITY'S HEALTH (EPOCH) (Adapted Version)



Credit: SPRING



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Objective

The **overall objective** of the EPOCH assessment is to evaluate the food environment for the presence of—

- food advertisements
- media promoting healthy diets
- food labeling.



Source: Alamy Stock Photo





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Research Questions

What is the presence of food advertisements, media promoting healthy diets, and food labeling elements within a locality and within a market?

How does the presence of food advertisements vary with locality (comparison between markets in the selected geographic locations and between weekly and daily markets)?



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Methodology: Food Environment Audit and Photographic Assessment

Community Observation Walk: Count the different types of advertisements using the data collection sheet and take photographs



Market Observation Walk: Assess prevalence of market advertising as well as food labels and take photographs



Data Analysis: Calculate frequency of food advertisements, types of locations of advertisements, and food labeling elements



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ASSESSMENT #7 PRODUCE DESIRABILITY (PRODES) (Adapted Version)



Credit: SPRING



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Objective

- The **overall objective** of the ProDes Tool is to assess consumer desirability of a determined market basket of five fruits and vegetables (FVs) using a sensory survey based on the the following five sensory parameters:
 - overall desirability
 - visual appeal
 - touch and firmness
 - aroma
 - size.
- Taste is not included as consumers do not generally have the opportunity to taste foods in the food environment prior to purchase.



Source: Creative Commons



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Research Questions

What is the desirability of a determined market basket of FVs based on sensory parameters?

How does the desirability vary with locality (comparison between markets in the selected geographic locations and between weekly and daily markets)?





Methodology: Sensory Survey

Free Listing to Select FVs: Create free lists of the most commonly consumed fruits (5) and vegetables (5) in the selected geographic location that will be in season when the assessment occurs.

Characterize High Quality FVs: Determine what constitutes high quality for each FV included in the market basket. All researchers are to be trained on what constitutes high quality for each FV before carrying out the assessments.

Implement ProDes: Carry out ProDes Tool to evaluate market basket items at two randomly selected vendors per market (12 markets / country) with 3 replicates per item per vendor.

Calculate ProDes Scores: Calculate ProDes scores separately for fruits and vegetables by averaging replicate scores for each item from each vendor for each observational sensory measure and tabulate for each market by averaging the vendors per market.



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Group Work



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Interpreting and Applying Findings from Market-Based Assessments

What can be improved in the overall food environment of the surveyed area?

What characteristics of the community may impact the food environment/access to the food environment?

Would it be beneficial to modify the number and types of market food environments in a given locality?

Are there times of the year when the food supply can be enhanced to support diets?

How can food supply be modified to better align with quantitative recommendations of selected FBDG?

Can policies be implemented to reduce the number of advertisements of unhealthy foods?



Group Work Instructions

1. Participants will divide into groups. Each group should select a speaker and a notetaker.
2. Each group will have received a packet of findings. Each packet includes findings from all seven assessments.
3. Groups should review the findings together and brainstorm ideas for interventions to improve diets and nutrition. Groups can also use this time to highlight information gaps and discuss other tools or assessment methodology that might be relevant.
4. Groups should summarize ideas for interventions and next steps on no more than three PowerPoint slides. **Please email your powerpoint presentation slides to noni_alexander@jsi.com**
5. Presentations: each group will report back to the larger group to set up for plenary discussion.



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Discussion



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Group I



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HONDURAS - QUESTIONS

Problem: low consumption of fruits and vegetables (Below 50 and 20%)

Fruitful Beginnings team concerns:

1. Cultural aspects associated with produce readily available at the markets (Do consumers like/ prefer/ need the produce sold to them?)
2. Climatic aspects / conditions?
3. Market size is not clearly defined (Supply - Demand?) Important factor
4. Cost factors associated with production, travelling to the vendors and
5. Are “Consumers” actually producing their own vegetables



HONDURAS

Problem: low consumption of vegetables among

1. Intervention 1: Work with vendors to change their produce display style to
 - No piles
 - Freshest produce displayed in front to attract consumers
2. Intervention 2: Invest in faster, subsidised transportation measures to make sure the fruits reach the vendors at their freshest state
3. Invest in processing measures to improve the value of their produce and shelf life
4. Invest in post production storage facilities



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Group 2



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Timor Leste

Proposal by fruitful Beginnings

Diagnosis based on available data (urban context)

- Too little consumption of healthy foods
- Diet diversity is low
- Healthy « markets » options are too low (mFREI)
- Daily markets offer more food too limited > should focus on them

Interventions for healthier diets

Combination between push (food vendors) and pull (consumers) dynamics

PUSH. Improve accessibility to credit for targeteting beneficiaries (unskilled women and youth)

- Scale up
- Entering into the business

Credit conditioned on the delivering of fruits and vegetables, linked to voluntary savings groups, protect women

PULL. Sensitivation campaing on the consumption of fresh fruits and vegetables. Address gender



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Group 3



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TEAM NIGERIA



What we observed

- Low availability and consumption of fruits & vegetables, especially DGLV and Vit A rich fruits&veg.
- Kebbi has the most number of open-air markets and convenience stores, but when you look at what they sell (total count of unique foods) they have the least.
- All 10 food groups are available in the markets, but does this not mean they are being eaten.
- Cost of protein rich foods cost is high
- Abundance of Ultra processed (noodles) & fast food

Interventions

- Assessing productivity and efficiency of livestock sector
 - Identifying interventions to increase cost-efficiency of LS sector and promote intake of Animal Sourced foods
- Interventions at different levels
 - Consumer level & behavioural change (food preferences within cultural context).
 - Food subsidies to increase assess and promote consumption (e.g., high price of fruits in Sokoto)
- Promotion of healthy foods (rather than unhealthy foods to limit)
- Transport & logistics, i.e., food supply
- Tax ultra-processed foods

Improvements

- Capture what is being home produced



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Group 4



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Liberia
Focus: Nimba county

Problems in Liberia

- Fruits vegetables legumes whole grains nuts dairy – all low
- Minimum meal frequency is low and declining further
- Minimum acceptable diet stayed low
- One third children stunted across all districts
- Markets not conducive to fruit consumption- why vendors not selling fruits? Seasonality, affordability?

Interventions

- Investigate why fruits are not sold
- Cooperative agreement between fruit growers and market vendors
- Govt Subsidies for inputs to grow fruits

Rationale

- Fruits availability low
- Desirability is high
- Market food diversity index is low
- Healthy eating index is very low
- IYCF indicators (MMF MAD) poor

Limitations / Challenges

- Market availability is low for fruits despite desire, WHY?
- Convenience an issue
- Policy



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Group 5



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Fruitful Beginnings- Timor Leste

Interventions

TOOL 7

- Desirability tool: sensory evaluation
- Type: descriptive test
- Panelist: semi and trained panelist
- Attributes of interest: color, size, texture
- Opportunities for vendors
- 1.packaging/labelling
- 2.storage
- 3.demand/supply ratio
- 4.value addition
- Opportunities for municipal authority
- 1.demarcation of market
- **Challenges**

Interventions

TOOL 7

- Cost of Healthy diet: establish absolute least cost diet available to meet dietary recommendation

Intervention

- Establish projects that would promote consumption of foods that are not commonly consumed to replace the commonly consumed but expensive food

Challenge

Price variability across different geographical areas

Intervention

- Seasonal Calendar of Availability
 - Identify foods species available throughout the yr
- 1. intervention in interlinking markets
- 2. Value addition for products
- 3. Preservation

Challenges

1. There is a lack of context on the reasons for the variations – Is it related to weather/Cultural



Side Event: ANH Academy Food Environment Working Group Consultation: Revisiting the ANH- FEWG Food Environment Framework

Tuesday 27 June, 17:00- 18:00 CAT (GMT+2)

- Christopher Turner (Natural Resources Institute, University of Greenwich)
- Leah Salm (Natural Resources Institute, University of Greenwich)
- Lydia O'Meara (Natural Resources Institute, University of Greenwich)
- Suneetha Kadiyala (London School of Hygiene and Tropical Medicine)

ANH2023

Agriculture, Nutrition and Health Academy Week

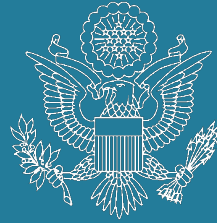
Research Conference (Hybrid: Lilongwe and online)



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Implemented by:
JSI Research & Training Institute, Inc.
2733 Crystal Drive
4th Floor
Arlington, VA 22202

Phone: 703-528-7474
Email: info@advancingnutrition.org
Web: advancingnutrition.org

USAID Advancing Nutrition is the Agency's flagship multi-sectoral nutrition project, addressing the root causes of malnutrition to save lives and enhance long-term health and development.

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