FOOD SYSTEM METRICS OF RESILIENT NUTRITION SECURITY IN AFRICA: A PROPOSAL

Presented

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Joint JRC-IFPRI conference on Quantitative Methods for Integrated Food and Nutrition Security Measurements: Lessons to be learned!
1. EXTREME EVENTS AND THE NEED FOR RESILIENT NUTRITION SECURITY (1/2)

- In recent years, agriculture and food systems have been exposed to severe extreme events in sub-Saharan Africa.
- These shocks are environmental, financial or socio-political.
- Each of these shocks, by extremely affecting agriculture systems, may have adverse effects on food security:
- Shocks could reduce the pace of progress towards food security for countries suffering from malnutrition; but
- Even where food security has been achieved, if it remains fragile, then shocks could be threatening nutrition and health status of the population.
- If food systems are vulnerable, nutrition security could not be resilient.
- In such context, extreme events could increase the rate of chronic diseases that may be linked with poor diets such as diabetes or heart diseases.
EXTREME EVENTS AND THE NEED FOR RESILIENT NUTRITION SECURITY (2/2)

- This seems to be the case in many Sub-Saharan African countries where...
- ... these chronic diseases are nowadays becoming major public health concerns
- Thus: urgency for analyzing the vulnerability of food and nutrition systems in order to strengthen the resilience of nutrition security through appropriate policy actions.
- The problem is not only that of achieving nutrition security, but also that of maintaining or sustaining it through a resilient food system.
- Hense, resilience needs to be systematically integrated into assessments of agricultural and food systems in Africa.
2. KNOWLEDGE GAP AND POLICY RELEVANCE OF THE STUDY (1/2)

- the majority of shocks affecting food and nutrition systems have shown to be unpreventable (Frankel, 2010)
- Policy responses to shocks seem either ineffective or insufficient
- attempts to fight or prevent shocks both by developed and developing countries do not work out so well (Nourou, 2015).
- there appears to be little to do to reduce shocks per se (Nourou, 2015).
- Consequently, sub-Saharan African countries can only accept these extreme events
- and policymakers should concentrate on finding the best way to cope with it
- Policy interventions should aim to enhance the resilience of food systems’ nutritional outcomes...
...by developing the capacity of food systems to provide resilient nutrition and health outcomes

Nevertheless, neither the research community nor policymakers have extensively taken resilience into consideration in Africa

Our argument: the absence of resilience considerations in the majority of agricultural and food policy interventions in Africa may be due to difficulties encountered in measuring those aspects of nutrition systems.

Our goal: propose a methodology in use for the measurement of resilient nutrition outcomes of food systems in Africa.
3. RESEARCH QUESTIONS (1/1)

- Main question:

  **How can we measure, in a holistic approach, the resilient nutrition outcomes of food systems in Sub-Saharan Africa?**

- specific questions:
  - What constitutes a resilient nutrition security in Africa?
  - How can we characterize African food systems’ capacity to provide resilient nutrition security?
  - How can we define holistic metrics of nutrition outcomes’ resilience to environmental, financial and socio-political shocks?
  - For each metric, what are the relevant indicators?
  - What is the appropriate system for weighting the indicators and what is the appropriate scoring?
  - How can such metrics be used to evaluate the resilience impacts of agriculture and food policy interventions?
4. OBJECTIVES OF THE STUDY (1/1)

- **Main objective:**
  construct innovative food system metrics that could serve as a measurement tool for assessing the state of the resilience of nutrition security and for the analysis of the effects of policy interventions on this nutrition security’s resilience.

- **Specific objectives:**
  - to describe a resilient nutrition security based on African diets,
  - give the appropriate characterization of food systems’ capacity to provide resilient nutrition security in Africa;
  - define holistic metrics of nutrition outcomes’ resilience to environmental, financial and socio-political shocks;
  - identify relevant indicators
  - provide effective methodologies for the construction of these metrics;
  - propose methods for using these metrics in the evaluation of resilience impacts of agriculture and food policy interventions.
5. METHODOLOGY (1/6)

- Metrics should consider the different aspects of nutrition security: nutritious food abundance (crop yields, food accessibility and food affordability), availability of adequate calories, micronutrient adequacy, and dietary diversity.
- Define a limited number of metrics for the resilience of each aspect of nutrition security.
- Each metric will be a weighted combination of a number of indicators.
- Indicators will be derived from a set of variables whose data will be collected through appropriate modeling.
- Check a variety of weighting methods for the indicators in order to retain the best way of setting weights for the aggregate index.
METHODOLOGY (2/6)

- an overall score for each metric
- check different scorings in order to retain the one that fit better the use of the index in the evaluation of resilience impacts of policy interventions.
- develop a method for quantifying each indicator on the appropriate scale
- consultations with experts on food, nutrition, climate change, finance, security and politics to further refine resilient nutrition metrics, the indicators and the variables as well as data.
- a validation workshop
**METHODOLOGY**

- **Aggregate index**
  - 4 resilience metrics: food availability, food affordability, nutrient adequacy, dietary diversity

- **Appropriate indicators**

- **3 categories of resilience capacity:** human and public capital, agroecological technology and innovation, livelihood and risk strategies

- **3 resilience functions:** adapt, transform, absorb
METHODOLOGY (4/6)
4 resilience metrics:

- Food availability
- Food affordability
- Nutrient adequacy
- Diets diversity
METHODOLOGY (5/6)

3 categories of resilience capacity

- Human and public capital
- Agro-ecological technology and innovation
- Livelihood and risk strategies
METHODOLOGY (6/6)
3 resilience functions
- Absorb
- Adapt
- Transform
<table>
<thead>
<tr>
<th>RESILIENCE METRIC</th>
<th>CATEGORY OF RESILIENCE CAPACITY</th>
<th>INDICATOR AND RESILIENCE FUNCTIONS</th>
<th>Types of shock concerned</th>
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<td>Resilience of Food Availability RFAv</td>
<td>Human and Public Capital</td>
<td>-Electricity (tdi)</td>
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<td>Agro-ecological Technology and Innovation</td>
<td>-GFSI food availability score</td>
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<td>-Precipitation in-depth (tdi)</td>
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<td>Livelihood and Risk Strategies</td>
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<td>-Grazing practices(tdi)</td>
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<td>Resilience of Food Affordability RFAf</td>
<td>Human and Public Capital</td>
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<td>-Kms of roads and railway (tdi)</td>
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<td>Livelihood and Risk Strategies</td>
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<td>Resilience of Nutrient Adequacy RNA</td>
<td>Human and Public Capital</td>
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<td>Agro-ecological Technology and Innovation</td>
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<td>Livelihood and Risk Strategies</td>
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<td>Resilience of Dietary Diversity RDD</td>
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<td>Agro-ecological Technology and Innovation</td>
<td>-Food Production Diversity(tdi)</td>
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Define appropriate indicators

Select the appropriate indicator if this already exists in the community of practice or in the literature

Define the set of variables to be included in the indicator if it doesn’t exist in the community of practice or in the literature
AGENDA: NEXT STAPE (2/2)

- Combine indicators to have an aggregate index
- Develop methodologies for the integration of the index in impact evaluation models.
Thank you