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Assessing Multidimensional Food System Risks: INFER

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Food systems face multiple threats:

- Conflicts
- Poverty and inequality
- Supply chain disruptions
- Climate change
- Inflation, price shocks
- Economic slowdown
- Environmental stresses
- Animal and human disease
- Financial instability and debt
INFER (INsights on Food SystEm Risks)
A comprehensive approach to assessing and tracking multidimensional food system risk
Providing insights on risk relating to 6 dimensions of food security: availability, access, utilization, stability, agency, sustainability.

Assessing risk to 3 food system outcome areas: (1) human health and nutrition; (2) ecosystem health; and (3) shared prosperity.

Identifying trends in hazard and exposure, vulnerability and adaptive capacity of food systems.

**INFER framework structure**

Risk = Hazard & Exposure * Vulnerability * Lack of Adaptive Capacity

### HAZARD & EXPOSURE

<table>
<thead>
<tr>
<th>Natural</th>
<th>Economic</th>
<th>Socio-political</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drought (2)</td>
<td>Economic instability (2)</td>
<td>Conflict related shocks (3)</td>
</tr>
<tr>
<td>Flood and storm (4)</td>
<td>Food price inflation (1)</td>
<td>Human epidemics (7)</td>
</tr>
<tr>
<td>Extreme temperature (2)</td>
<td>Trade exposure (1)</td>
<td></td>
</tr>
</tbody>
</table>

### VULNERABILITY

<table>
<thead>
<tr>
<th>Availability</th>
<th>Access</th>
<th>Utilization</th>
<th>Stability</th>
<th>Agency</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (3)</td>
<td>Critical population share (3)</td>
<td>Disease burden (3)</td>
<td>Financial system (2)</td>
<td>Aid dependency (2)</td>
<td>Input intensity (3)</td>
</tr>
<tr>
<td>Trade (3)</td>
<td>Household food acquisition (5)</td>
<td>Nutritional deficiency (5)</td>
<td>Markets (2)</td>
<td>Gender inequality (3)</td>
<td></td>
</tr>
<tr>
<td>Poverty and inequality (2)</td>
<td>Obesity (2)</td>
<td></td>
<td></td>
<td>Producer inequality (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rural/urban Inequalities (2)</td>
<td></td>
</tr>
</tbody>
</table>

### ADAPTIVE CAPACITY

<table>
<thead>
<tr>
<th>Availability</th>
<th>Access</th>
<th>Utilization</th>
<th>Stability</th>
<th>Agency</th>
<th>Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural orientation (2)</td>
<td>Economic and public support (1)</td>
<td>Infrastructure (3)</td>
<td>Government effectiveness (2)</td>
<td>Norms and Institutions (2)</td>
<td>Biodiversity and ecosystem management (2)</td>
</tr>
<tr>
<td>Resource base (2)</td>
<td>Physical (3)</td>
<td>Health institutions (2)</td>
<td>Foreign exchange reserves (1)</td>
<td>Participation and voice (1)</td>
<td>Climate mitigation (1)</td>
</tr>
</tbody>
</table>
What are some notable overall risk trends in Asia and the Pacific?

- Risks have increased in most countries in the last 5 years

- Some countries face high and increasing risk (e.g. Afghanistan, Pakistan, Islamic Republic of Iran, and others)

- Risks are also increasing in some low-risk countries (e.g. Australia, New Zealand, Republic of Korea and others.)

- Overall, risks have declined in some high-risk countries (e.g. India, Bangladesh, and others.)
What are the trends?

- **Vulnerability** has been on the rise for years.
- Risks related to hazard & exposure and **lack of adaptive capacity** have **decreased** over the past 20 years, but rose again in the last 3 years.

- Significant improvement/risk reductions in safe and healthy **utilization** of food.
- The **instability** of food systems (e.g., food price inflation) is the main driver of risks in recent years, followed by slow improvements in **sustainability** (e.g., climate mitigation, input intensity).
What are the main risk drivers for different income groups?

High-income countries face relatively high risk regarding environmental stresses and ensuring food systems stability. On the other hand, these countries have relatively low risk in utilizing safe and nutritious food as well as ensuring agency.
What are the main risk drivers for different groups of countries in special situation?

**Hazard and exposure**
- Trade exposure [ECO]
- Food price inflation...
- Economic instability...
- Water stress [NAT]
- Other natural...
- Flood/storm/cyclone...
- Extreme...
- Drought [NAT]
- Human epidemics...
- Conflict related...

**Vulnerability**
- Trade [AVA]
- Production [AVA]
- Poverty and...
- Household food...
- Critical population...
- Obesity [UTI]
- Nutritional deficiency...
- Disease burden [UTI]
- Financial system...
- Market stability [STA]
- Rural/urban...
- Producer prosperity...
- Gender inequality [AGE]
- Aid dependency [AGE]
- Input intensity [SUS]
- Sustainable...

**Adaptive capacity**
- Resource base [AVA]
- Agricultural orientation...
- Physical access [ACC]
- Economic and public...
- Health institutions [UTI]
- Infrastructure [UTI]
- Foreign Exchange...
- Governance...
- Resources and...
- Participation and voice...
- Norms and institutions...
- Climate mitigation [SUS]
- Biodiversity and...

**Risk value compared to AP avg**
- SIDs
  - High risk
- LLDCs
  - High risk

Landlocked developing countries in AP, 2022

Small island development states in AP, 2022

What are the main risk drivers for different groups of countries in special situation?
Which food system outcomes are at risk in which countries?

- Countries at the upper end of the scale may strengthen risk-informed measures to enhance national food system transformation pathways.
Understanding risk is important for managing risk – INFER provides key insights

- Food systems resilience-building strategies must respond to the risk profile of each country – which is shaped by longer-term trends
- Tracking “near-term risk” requires a complementary model
- Caveats relate to data availability for some critical issues.
- Expert review and discussion on how to apply INFER at the national level, will take place in September 2023, along with the release of a working paper.

For more information on INFER
www.unescap.org/projects/infer
Thank you!
Contact us at escap-edd-edps@un.org